NATURE MAGAZINE

APRIL 1924

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Nature Calendar

APRIL

Our souls, longing for the beauty of spring, rejoice at the awakening world, the delicate green of the woods and the soft silvery notes of birds at morning.

Soft laughing rains coax the buds to unfold and the grass to spread its deep-piled green carpet over all the earth.

Dainty clusters of pale pink or white spring beauties may be found in the open meadows.

Adder's Tongues compete for first spring wild flower blooming honors.

The very breath of spring is in the perfume of the Trailing Arbutus. The thoughtless destruction of so many of these plants is indeed a great loss.

The fern-like leaves of the Squirrel Corn take advantage of the sunlight which is still unobstructed by foliage.

Down in the meadow patches of Bluets, like reflections from the sky, "spread a beautiful carpet before the feet of advancing spring."

Dwarf White and Nodding Trilliums are in bloom in the rich moist woodlands.

Hungry bees eagerly seek the pollen of the Bloodroot.

Magnolia buds have become enlarged and pink-tipped.

When the buds on the Maple tree begin to open, the sap becomes bitter and the sugar season is past.

The Woolly Bear is spinning his cocoon. Like the princess in the fairy tale he weaves his own hair into his garment.

In the hollow of some tree little blind helpless baby Raccoons huddle together for warmth.

The Red Squirrel is wearing a beautiful bright coat of tawny red to attract the eye of his chosen love.

Garter Snakes, after winter's inactivity, are again foraging about in the underbrush.

Muskrats are raising their first broods. To prevent "race suicide" they must raise large families, often as many as three a season.

The male Sunfish is beautifully colored during his mating season.

The chorus of the Spring Peepers is as delightful as the songs of the birds.

Aldebaran, the rosy star in the constellation Taurus is a comparatively near neighbor of ours. It takes light only thirty-two years to travel from it to us.

Most of the bird migrants this month are seed-eaters. Toward the end of the month, with the advent of many insects, migrations will be more general and regular.

Robins are busy house building. Perhaps you will see them shaping the inside of their nests with their bodies, turning round and round to make them smooth and symmetrical.

Wild Geese are returning to northern haunts.

By the end of the month Barn Swallows will be on their homeward way.

The plaintive sweet song of the Meadow-lark comes across the open fields.

The spring song of the Flicker is a jolly rollicking "wick-a, wick-a wick-a-wick."

The young of the Great-horned Owls are ready to leave their nests and test their untried wings.

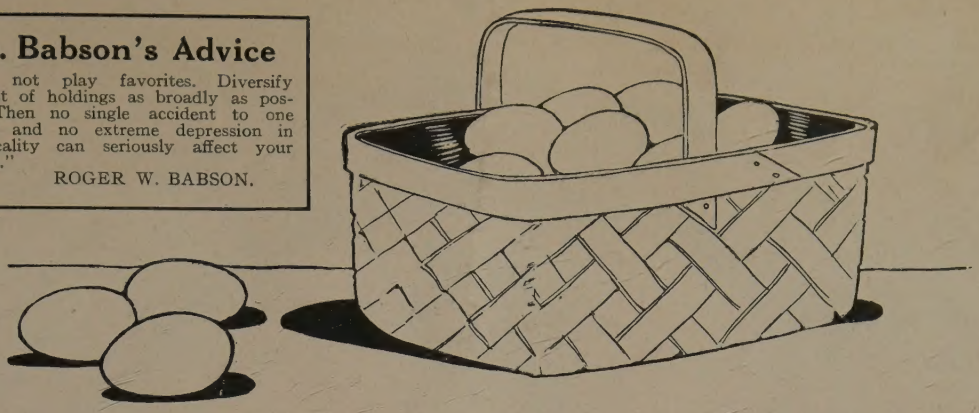
Do you know the range of color in birds' eyes? They may be white, red, blue, yellow, brown, gray, pink, purple, or green.

Prepared for NATURE MAGAZINE by the Cleveland Museum of Natural History

Mr. Babson's Advice

"Do not play favorites. Diversify your list of holdings as broadly as possible. Then no single accident to one concern and no extreme depression in one locality can seriously affect your position."

ROGER W. BABSON.



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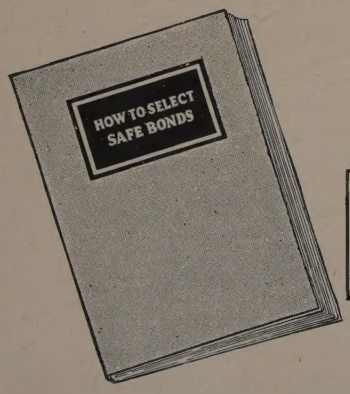

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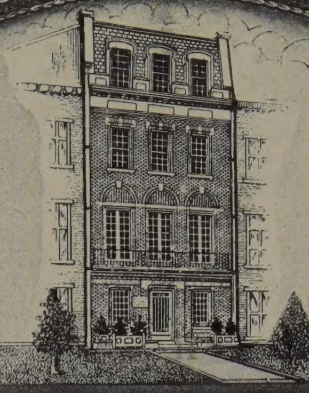

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25 Cents A Copy

APRIL, 1924

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NATURE MAGAZINE

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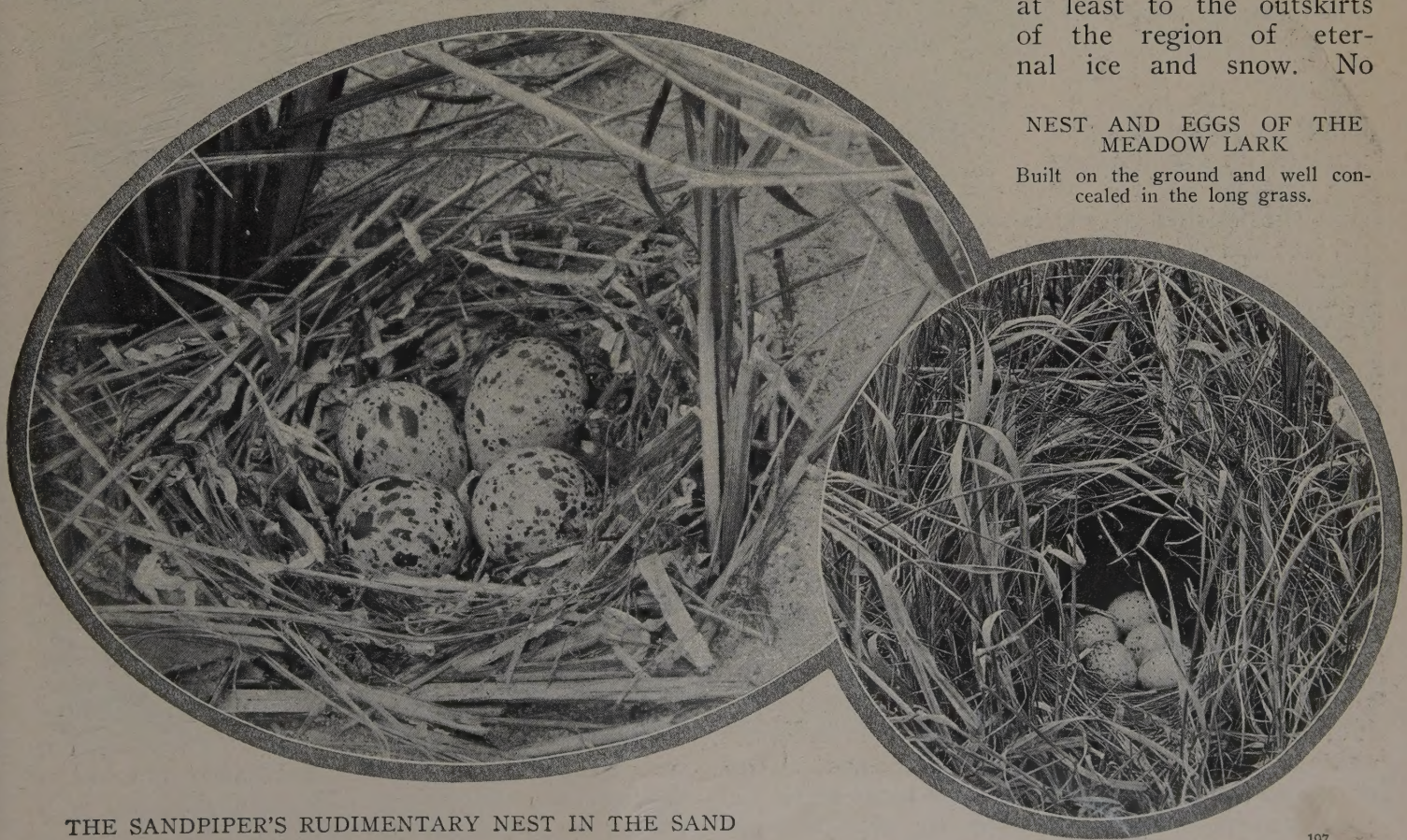
Bird Architects and Architecture

By L. W. BROWNELL

(Photographs by the author)

BIRDS are, by no means, the only creatures that build nests, but they are, beyond doubt, the only class of animals with which the term is inseparable, at least in the minds of the great majority of people. It is true that many of them build no nests at all, but the majority are such wonderful architects and the styles of their dwellings, if we may apply such a term to a structure that is used only to hold and protect the eggs and young, are so many and diversified, that we have come to know the birds as the nest builders pre-eminent in Nature's realm.

Birds build their nests nearly everywhere and in almost every conceivable situation. They are to be found on the ground and even beneath its surface; in low bushes and in the topmost branches of the tallest trees; on the sands of the seashore and the ledges of the most inaccessible cliffs; from the miasmic depths of the lowest, most dismal swamps and marshes to the limit of vegetation on the highest mountains; from the sun-scorched desert and treeless plain to the deepest forest, where the sun's rays scarcely ever penetrate; and from the equator nearly to the poles, or at least to the outskirts of the region of eternal ice and snow. No



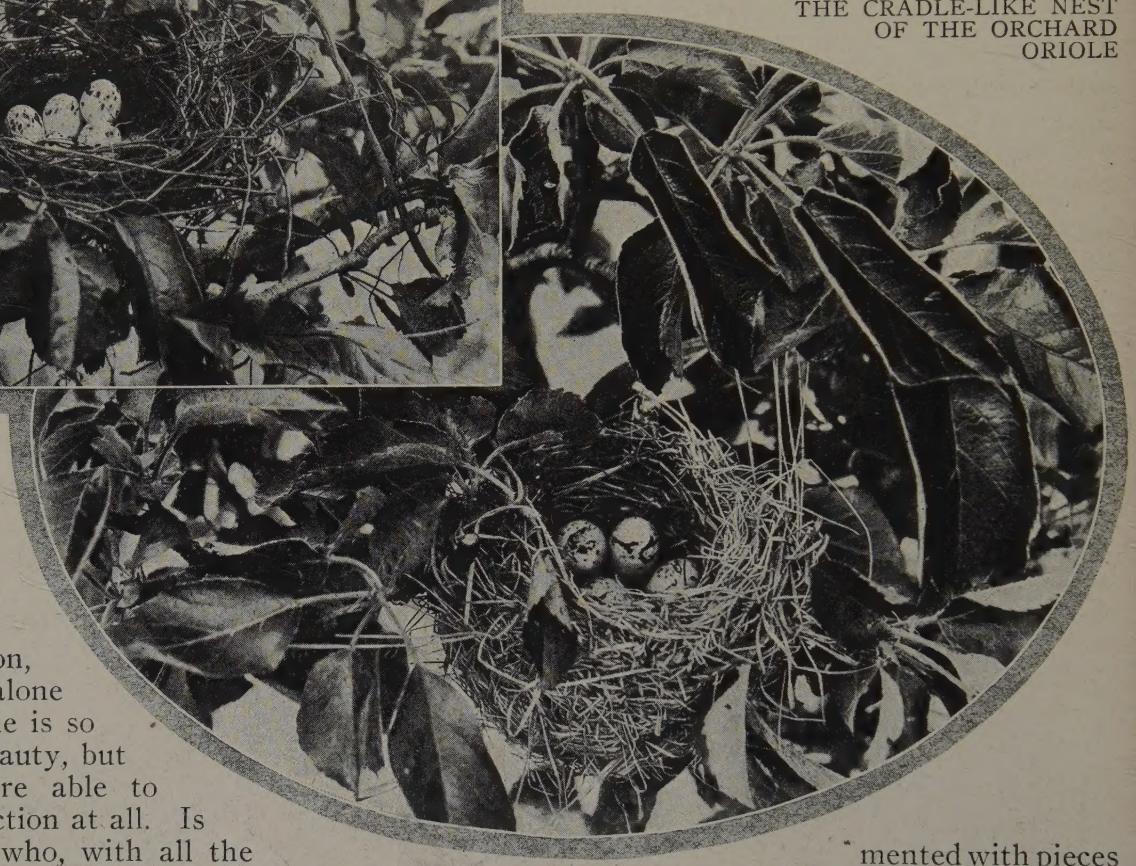
NEST AND EGGS OF THE MEADOW LARK

Built on the ground and well concealed in the long grass.

THE SANDPIPER'S RUDIMENTARY NEST IN THE SAND

one, upon examining a bird's nest, can help but be struck with the beauty of its symmetry and the intricacy of its structure. When we stop to consider that it has all been made by two little creatures with no other appliances than their feet and bills, the latter being the principal tool used in its construction, the wonder is not alone that the finished article is so perfect and of such beauty, but that the builders were able to accomplish its construction at all. Is there a human being who, with all the tools and appliances which we would be able to bring to his assistance, could reproduce one of the very simplest types of these abodes? I think not.

KINGBIRD'S NEST
Built on topmost branches of an apple tree.



Below
THE CRADLE-LIKE NEST OF THE ORCHARD ORIOLE

However, the nest building of a bird is a business, a necessity, and beauty is by no means the end for which they strive in their architectural designs. This does not necessarily argue that the birds are possessed of no artistic or aesthetic sense. On the contrary, birds are probably more highly endowed with such a sense than are any other creatures with the possible exception of human beings. There are innumerable instances that could be related as evidence in support of this statement, instances in which the birds have, beyond any possible doubt, used this artistic sense consciously not only in their home life, but also in their actions at other times, especially during the courting season. The example par excellence, however, and the only one that I intend to mention here, is that of the bower birds of Australia. These birds, of which there are several species, build regular bowers of twigs in addition to their regular nests, and usually at some distance from them. These they use for a kind of playground, and especially as a place for dancing and posing during the courtship days. These bowers are all ornamented with pieces of bright colored stones, shells, etc., and one species even lays down a lawn of moss in front of the bower which it keeps decorated with flowers and buds, each day replacing those that are faded with fresh ones. Even the most skeptical must admit that this shows a rather highly developed sense of the artistic.

The nest of a bird, however, is entirely a utilitarian affair and if, in the building, it is formed in such shape and constructed of such material as to give it beauty in our eyes, it is a matter more of accident than design. The one and only object for which the birds aim is to erect a structure in which may be combined the greatest amount of security for themselves and their offspring with the greatest amount of comfort. In placing on

the outside such materials as bits of lichens and moss, which invariably lend considerable beauty to the structure, they are but adorning it in such a manner as will cause it to conform most closely to the general tone and appearance of its immediate surroundings and thus give its inmates greater security from the sharp eyes of their searching enemies by making it less easily seen.

The one great end for which all the birds strive in their nest building is protection for their young through invisibility. This is but carrying out the law of the survival of the fittest, and is attained, to a considerable degree at least, by using such materials in the nest construction as will blend best with the surroundings of the situation in which the nest is placed. One of the very best examples of this of which I know is the dainty little jewel of a nest built by the ruby-throated humming bird. Saddled on the horizontal limb of a tree, this diminutive nest, the smallest of any built by our native birds and hardly more than an inch and a half in diameter, is so covered on the outside with bits of lichen as to resemble almost exactly an excrescence on the limb itself, thus making it extremely difficult to locate, especially when viewed from beneath. The nest of the wood pewee, built in much the same manner, is another good example of this protective adornment. The little Parula warbler has also succeeded in making its nest almost invisible by placing it in the midst of a bunch of usnea moss hanging from some tree where it is practically indistinguishable, by the sharpest of eyes, from the moss itself.

Even in the case of such birds as build extremely rudimentary nests, or none at all, such

EGGS OF THE WHIP-POOR-WILL
One of the birds that builds no nest.

NEST AND EGGS OF THE BLUE BIRD
Built in a natural cavity in a tree.

NEST OF THE WOOD PEWEE
Saddled on a branch and well concealed by a covering of lichens.

NEST OF THE FAMILIAR ROBIN
Note that the nest is plastered together with mud.

as the terns, gulls, sandpipers and other shore nesting birds, which often lay their eggs simply in a slight hollow in the sand or among the pebbles of the beach with little or no attempt at nest building, this is, undoubtedly, done from no oher reason than that of protection. The eggs of these birds closely resemble, in both their color and markings, the sand and pebbles on which they are laid, and the making of a nest would make them much more conspicuous. I have looked directly at the eggs of the least tern, lying in their inconspicuous hollow in the sand, without immediately seeing them, and I once actually stepped on the nest and eggs of a spotted sandpiper, for which I was searching, so closely did the eggs and the few straws that composed the nest conform to the surroundings. The whip-poor-will, night-hawk and all of their family make no nest but deposit their eggs directly on the ground or upon the dead leaves which cover it. This is done for the same reason, although some individuals occasionally make the mistake of placing their eggs where they are more or less conspicuous. Many night-hawks have discovered that the tar and pebble covered roofs of our city houses offer a most excellent place in which to rear their young undisturbed. It is true that against this background both the eggs and the bird itself when sitting are almost indistinguishable.

NEST OF A CROW

In the topmost branches of a tree and over one hundred feet above the ground.

The nest of a bird is used only during the breeding season and deserted, by the majority of them, never to be used again after the brood has left. There are a few exceptions to this rule, noticeably in the case of the Raptores (hawks, owls, etc.), many of which return year after year to the same nest. Notwithstanding, the construction in every case is as thorough as though the nest were to be used for years instead of a few short weeks at most, as is usually the case. The nest-building faculty of the birds has been the subject of a popular myth for years which has accredited them with a sort of sixth sense which enabled the young birds to build their first nest entirely typical of their species and as perfect as those made by the older, more experienced builders. That instinct does play a small part in the successful carrying out of this work is undoubtedly true, but

RED-EYED VIREO'S NEST
This bird is a wonderful maker of baskets.

it is truer still that this instinct is largely qualified by an imitative and also an actual reasoning faculty. That imitation is one of the greatest factors in the actual building of the nest is abundantly evidenced by the fact that birds reared in captivity have but little idea of nest building, merely dragging together a heterogeneous mass of material without shape or individuality. If instinct alone was responsible for their nest-building ability, then the nest of the pair reared in captivity would, necessarily, be as perfect a specimen as that built by a wild pair. Moreover, if the birds were without any reasoning power, then each succeeding generation would not only construct their nests in exactly the same manner but place them in the same situations as did their ancestors. As a matter of fact nest building is largely governed by evolution, and the nests of the different species, as well as the situations in which they are placed, change as the requirements, or opportunities, of the builders demand. Many species have shown that they are possessed of a progressive spirit that has prompted them to take advantage of improved conditions offered by the advance of civilization. Thus the Chimney Swift, which, before houses with chimneys were built, lived and built its nests in hollow trees, now usually finds chimneys more satisfactory and infinitely safer. The Barn Swallow, which formerly built its nest on a ledge on the side of some cliff or cave, a situation still sometimes utilized in the wilder parts of the country, now generally makes use of the rafters of our barns as offering better protection both from the elements and his enemies. The natural

NEST AND EGGS OF CHESTNUT-SIDED WARBLER
Containing egg of a Cow Bird.

nesting place of the Phoebe is a narrow ledge on the face of some cliff, but the greater majority now find that bridges, outhouses and other man-made structures offer more advantageous situations, and a pair is rarely found occupying the former site. The Martins and Wrens, which once bred in hollow trees exclusively, now prefer the bird boxes erected by kindly human beings when they can find one before it is preempted by the ubiquitous English sparrow. One could continue the list almost indefinitely, but I think that this is enough to prove my contention that the birds are far from being the mere unreasoning creatures of instinct that most of us believe them to be.

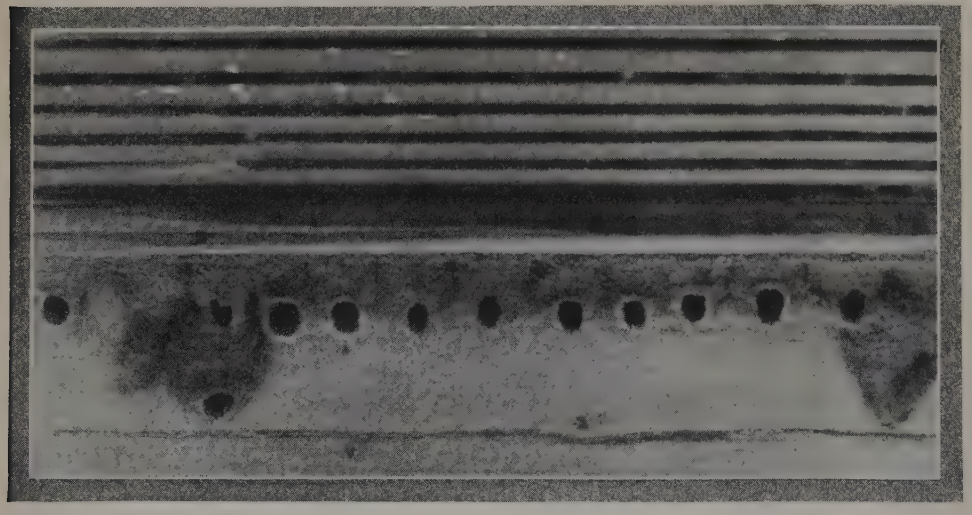
Just why it is that the different species are so absolutely diversified in their manner of nest construction as well as in the choice of situation is a question that no one has, as yet, answered to complete satisfaction. It is, undoubtedly, a result of evolution, as is also the actual building of the nest. When the birds and the reptiles commenced their

THE LOOSELY BUILT NEST OF THE GREEN HERON

lines of divergence from a common ancestor it is extremely doubtful if there was any attempt at nest building. This came later with a very crude beginning and, as evolution continued, the structure was gradually improved upon as requirements demanded. As different species were evolved they found that their requirements demanded some form of nest different from that which their ancestors had been constructing, and so each gradually designed its own individual style of architecture as it learned what was best suited to its wants, and to these styles its descendants cling.

The choice of nesting sites, without doubt, came about in the same manner. One author advances the theory that the situations are chosen with regard to the source of food and nest-building material supply. This theory explodes, however, in view of the fact that many birds, especially among the fish-eaters, which breed in colonies, very frequently locate these colonies at a considerable distance from the nearest available source of food supply, and it is often the case that a bird will carry nesting material three-quarters of a mile or more when suitable material might have been found much nearer the chosen site. Whatever the reason, the fact remains that the situations chosen and the materials used in the building are about as diversified as there are situations and materials from which to choose in the world.

THE CHIMNEY SWIFT WAS THE ORIGINAL JOINER

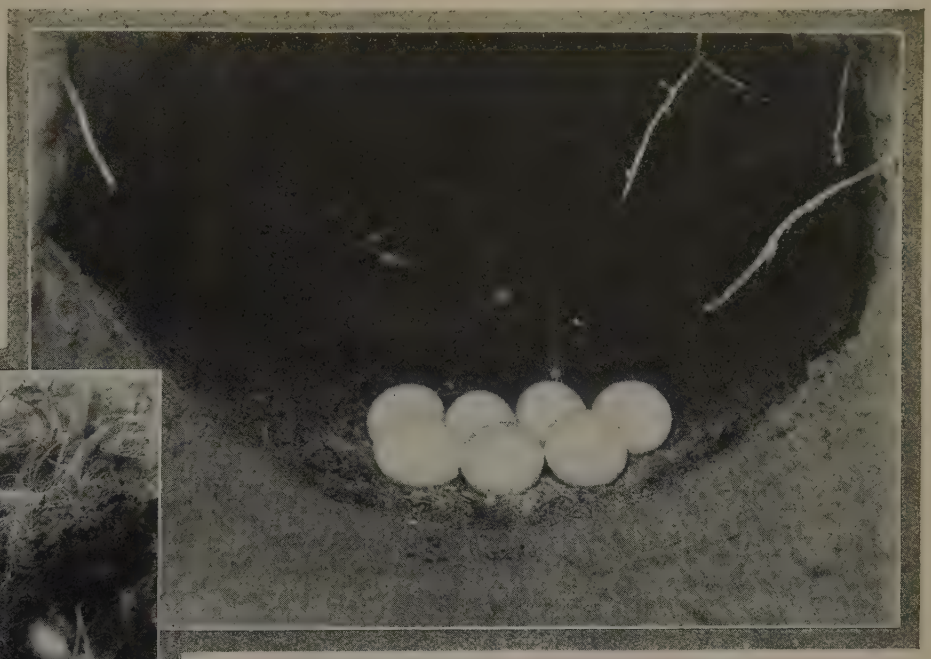


CLIFF SWALLOWS' NESTS UNDER EAVES OF A BARN
They were the first pottery makers.

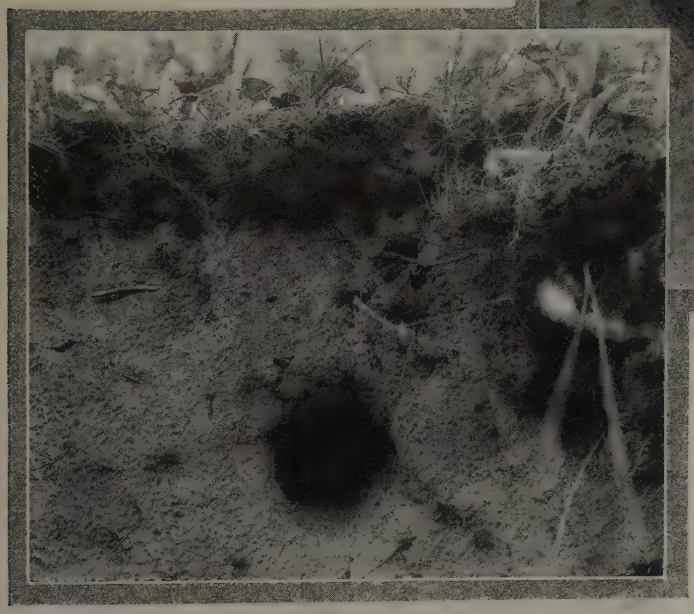
Each species adheres rigidly to its own particular style of architecture and same general style of nesting site.

Birds may well be said to represent, in their nest-building activities, the different vocations of mankind. There are the miners represented by the kingfishers, bank swallows and burrowing owls, which excavate tunnels in the earth and construct an enlarged chamber at the end wherein to deposit their eggs and rear their young. The

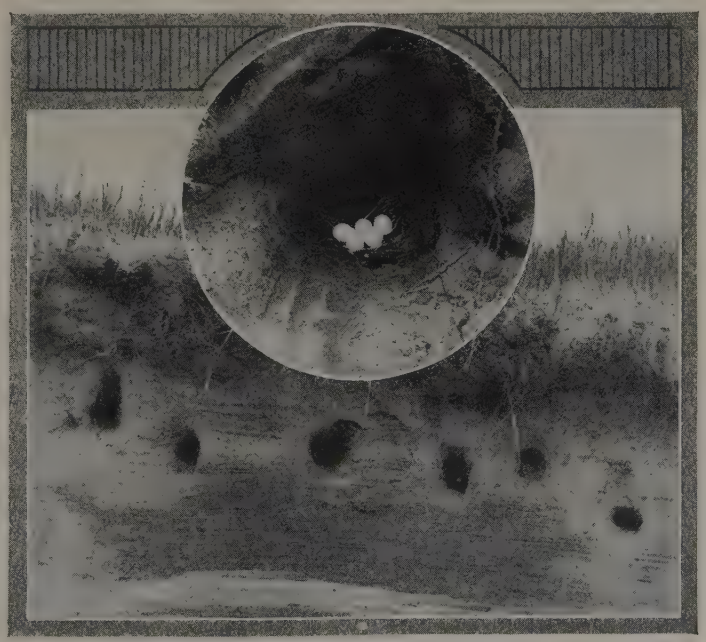
woodpeckers are fairly efficient carpenters for, using their bills as chisels, they make deep excavations in the limbs and trunks of dead or even living trees in which to make their abode. They sometimes line the bottom with a little soft material, but more often they deposit their eggs directly upon the chips that accumulate during the process of boring, and upon this rather rough bed the young must make themselves as comfortable as possible. Those birds which, like some of the Thrushes, or more noticeably still the flamingo of the south, employ a clayey mud in the foundations of their nests, may well be called the masons. Where is it possible to find more dextrous weavers than are the Baltimore and orchard orioles of our own country or the weaver birds of Africa and India? Then there is the little tailor bird of India. He is small, not much larger than a wren, but his specialty is the sewing together of several large leaves to form a bag wherein he places his nest. His bill forms the needle, and the long, pliable fibers of different plants, or even strands from a spider's web, form the thread. These bags are very difficult of detection as they hang in the trees, and thus they form the greatest protection for their occupants. Our little marsh wren is an accomplished plaiter of reeds. His abode is a symmetrical ball of plaited rush leaves, warmly lined with cat-tail pappus, and so closely woven as to be entirely impervious to the hardest driving storm. No basket-maker can hope to surpass the skill of our vireos, whose cup-shaped nests, woven of strips of grapevine and other vine and weed bark, grasses and like material, are real marvels of symmetry and beauty. The barn swallows were the original brickmakers, and the cliff swallows can well be called the first pottery makers. The chimney swifts are joiners which use a glue of their own secretion with which to join together the twigs of which their



KINGFISHER HOLE
Opened to show the eggs.



ENTRANCE TO TUNNEL OF THE KINGFISHER
One of the miners among birds.



NESTING BURROW OF BANK SWALLOWS
Opened to show nest and eggs.

ENTRANCE HOLES TO BURROWS OF BANK SWALLOWS

nest is composed and attach the whole to the inside of a chimney. There are several species of swift that inhabit the Andaman and Molucca groups of islands whose nests are composed entirely of a gelatinous secretion of the salivary glands which hardens quickly upon coming into contact with the air. These are the nests from which is made the famous bird's nest soup so highly prized by the epicures of the east. Can we not truthfully say that these birds were the original noodle makers? In Australia there are birds that actually build incubators, great mounds of decaying vegetable matter that, acted upon by the rays of the sun, generate a heat sufficient to hatch the eggs that are deposited in the midst of them. Thus are the makers relieved of the tedious duty of brooding them. In this country we have a bird which, I am sorry to say, is still more lazy—so much so that it will not build a nest or even hatch its own eggs or tend its young. I am speaking of the cowbird, which lays its eggs in the nests of other birds, thus forcing them to hatch them and feed the young. The European cuckoo is guilty of the same obnoxious practice.

Birds occasionally use strange material in the construction of their nests. I once found the nest of a yellow warbler composed entirely of white cotton waste and a nest of the Baltimore oriole woven completely of red and blue yarn. The former was fully twice the size of the typical nest of this species, and both were conspicuous in the extreme, a direct departure from the usual practice. In Maine, in places where the usnea moss was plentiful, I have found the nests of the cuckoo made entirely of this substance instead of the usual twigs, and I once found the nest of a wood thrush composed entirely of an old newspaper torn into strips and held together with mud. The Rev. J. G. Wood mentions finding in Switzerland the nest of a wagtail made entirely of watch springs which the birds had collected from the rubbish heap of a nearby factory. Mr. Hudson tells of a spotted flycatcher whose nest, found in London, was made of wax matches, and he also mentions the nest of a pigeon made entirely of hairpins and wire.

Top SYMMETRICAL NEST OF THE MARSH WREN
Made of plaited rush leaves.

Middle NEST OF THE LEAST BITTERN
A mere platform among the rushes.

Bottom DAINTY LITTLE JEWEL OF A NEST
Built by a humming-bird.

Abnormal nesting sites are also far from unusual. I have found the Wilson's thrush, which normally builds upon the ground, making its nests in saplings twelve to fifteen feet above the ground. Not many years ago a pair of wrens under my observation started a nest in the end of a water spout, but, needless to say, the first rainstorm taught them a lesson by washing it all out. I have, upon several occasions, found robin's nests in old woodpiles, and I once found the nest of a song sparrow in a hay mow inside of a barn; and that of a kingbird on top of a stump standing in middle of a pond. Nests have been found in discarded cans, pottery, kettles, saucepans, old hats and innumerable other such unlikely places. All of which proves that birds are not entirely the creatures of habit or instinct.

NORTHERN FLYING SQUIRREL

Gathering itself together for a glide from a stump four feet high, which will carry it about thirty feet.

The Flying Squirrel

By A. BROOKER KLUGH

Contributing Editor
Nature Magazine

(Photographs by the Author)

ALTHOUGH a common mammal throughout the forested regions of eastern North America the flying squirrel is, on account of its nocturnal habits, one of our least known animals.

There are two species of flying squirrels in North America east of the Rocky Mountains. *Glaucomys volans*, which is about nine inches in length and has the fur on the under parts white to the roots, occurs from the Gulf of Mexico north to Lake Erie and southern Lake Michigan and the southern New England States, and west to the edge of the prairies. *Glaucomys sabrinus*, which is twelve inches long and has the fur of the under parts white, but ashy at the roots, occurs from the northern New England States and northern Michigan north to the limit of trees and west through Manitoba, northern Saskatchewan and northern Alberta to the Mackenzie River region.

The characteristic external features of the flying squirrels are the membrane which stretches between the legs on each side, the flattened tail, the large eyes, and the soft, velvety, fawn-brown fur. The membrane which extends from the front

THE FOLDS OF THE SIDE FLAP

When the animal springs into the air with its legs wide spread, the flaps form a wide, flattened expanse, which acts as a parachute while the tail serves as a rudder.

to the hind legs is an extension of the skin of the upper and lower surfaces of the body, and is furred on both sides, fawn-brown above on its inner portion, becoming dark blackish-brown towards the edge of the flap, and white beneath. When the animal is at rest, or running about, this flap lies in loose folds; when it springs into the air, with its legs wide spread, it forms a wide, flattened expanse which acts as a parachute. The flattened tail acts both as an auxiliary parachute and as a rudder to give direction to the flying leap. The large size of the eye would in itself be sufficient to mark the flying squirrel as a nocturnal animal, and contributes materially to the shy and gentle appearance of this mammal.

The flying squirrel, in spite of its name, does not fly, as the membranes at the sides play no part in imparting a forward motion but act only as planes. It can, however, make flying leaps of considerable length, provided it starts from a point of some altitude. In these leaps the animal first goes out at an angle of about thirty degrees with the trunk of the tree from which it springs, then horizontally for a little distance, and finally upwards to about one-quarter or one-third the height from which it started. I do not know what constitutes the "official record" for a flying squirrel's leap, but I have seen them take off from the top of a tree thirty-five feet in height and sail to the trunk of a tree forty yards away, and have seen one spring from a stub and go off down a mountainside for more than a hundred yards. I have also seen them jump from a height of only four feet and glide for thirty feet before coming to the ground.

An interesting point in connection with the aerial activity of this species is brought out by the experience of my friend, Harley C. White. Finding a mother and four recently born young in a hole in a tree, he took them home and placed them in a large cage. About the time the young were weaned the mother died, and Mr. White felt that it was incumbent upon him to bring the orphans up in the way they should go and give them a chance to develop their leaping abilities. So he took the young, which were very tame, from their cage, carried them out into the garden, and from a distance of about two feet tossed them, one at a

FOLDING THE TAIL

The characteristic attitude of the northern flying squirrel when running about.

Above

THE FLATTENED TAIL

The flossy-furred tail of the northern squirrel is most effectively shown in this photograph.

time, towards a post. They spread their side flaps at once when they were launched into the air and alighted on the post in quite orthodox fashion. He then gradually increased the distance from the post and soon could toss them from a distance of forty feet or more. Finally he found that he could take these flying squirrels, throw them high into the air as hard as he could in a direction *away* from the post, when they would turn in the air and sail back to the post.

Flying squirrels are among the gentlest of our wild mammals. Last summer one of these animals, captured the night before and free in a room in a summer cottage, was feeding out of my hand fourteen minutes after I entered the room. Prof. F. H. King records that some young flying squirrels he had took a great delight in playing about him, running in and out of his pockets and between his coat and vest, and liked to go to sleep under his vest. He also describes the manner in which these young flying squirrels rolled themselves up to sleep by placing their noses on the support on which they happened to be, walking forward until their noses almost protruded between the hind legs, then wrapping their tails in a horizontal coil about their feet, the result being exquisite little balls of soft fur.

The home of the flying squirrel is generally a hole in a stub, excavated by one of the woodpeckers. Usually a pair or a solitary individual live in one of these abodes, but sometimes in late autumn or during the winter several are found living together in the same cavity, it being stated by Prof. U. O. Cox that he found fifteen in a hollow stub.

FROM ONE TREE TO ANOTHER

They can take off from a tree of moderate height and sail to the trunk of a tree forty yards away.

The young of the flying squirrel number from three to six, most usually four, and are born towards the end of April. They are one-third grown by the middle of June and by the middle of July are about two-thirds adult size. Audubon and Bachman give an account of a female northern flying squirrel who carried her five young from a hollow stub which was on fire, taking them, one at a time, in her mouth and depositing them in a stump at a little distance, the mother having her fur singed in effecting the rescue.

There appears to be little accurate information as to the food of the flying squirrel. Acorns and nuts are recorded as being among their staple articles of diet, and from the fact that the northern flying squirrel lives in the dense spruce woods it seems probable that it feeds largely on the seeds of the spruce.

The flying squirrel does not hibernate, but is active throughout the winter, even in the far north.

Flying squirrels never voluntarily emerge from their retreats during the daytime, even on the darkest days, but soon after the sun has set they come forth and we may catch glimpses of them flitting about in the gathering dusk. Then the curtain of darkness comes down and shuts out from our eyes the activities of the gliders of the night.

The President's Statement to Congress

"Reforestation has an importance far above the attention it usually receives. A special committee of the Senate is investigating this need, and I shall welcome a constructive policy based on their report."

CALVIN COOLIDGE.

Insects' Sense of Taste

By H. A. ALLARD
United States Department of Agriculture

MY SON Howard, who has become an enthusiastic stamp collector, recently brought to my attention a 2-cent carmine postage stamp 1903 issue mutilated in a most remarkable manner. This stamp, which he found attached to an envelope in an attic at Oxford, Mass., had been eaten completely away in certain areas, presumably by tiny ants. Such nice powers of discrimination were shown that only the white or slightly dyed portions were usually attacked with the nicest precision. The accompanying photograph, showing the mutilated stamp and an untouched stamp for comparison against a black background and enlarged about three and one-half diameters, indicates the areas attacked and eaten away. It will be noted that the white border has been practically removed around the entire stamp, the insect following with the greatest nicety the dark red border, invading this only where the lighter wreath around the figure 2 has cut this border. A considerable portion of the wreath of olive leaves has been cut away around the left-hand figure 2, while only a slight indentation has been cut into the wreath of oak leaves surrounding the right-hand figure 2. The ball of the left-hand figure 2 has been cut away, and a hand lens shows that the body of the figure has also been scraped very thin. This is shown by the whiter appearance of this portion of the figure. The right-hand figure 2 has been attacked in the same manner, the ball being eaten away, much of the body completely removed as well as a small portion of the tail. To the left of this figure 2, the wreath of oak leaves has been entirely removed, the surrounding dark red areas being avoided. Above this figure 2 the greater portion of the vertical stripes has been removed to the very edge of the vertical, deep red border throughout and along the horizontal line separating the stripes from the deeper red background containing the stars.

INSECTS HAVE EATEN THE WHITE PORTIONS

Probably ants, carefully avoiding the dyed sections of the stamp, ate the white because of the gum on the back of the stamp.

It will be noted that a portion here has been completely removed, while the remaining portion of the stripes along this horizontal line has been scraped very thin. A small hole has been eaten through the body of the tiny *s* in cents. The lighter portions of the head of Washington have been largely eaten way, the darker areas surrounding the eyes and nose being left. Portions of the letter *S* and *A* in States have been removed, as well as in the letter *M* in America.

Wherever the stamp has been eaten it is evident that the white or more lightly dyed portions have been attacked in preference to the deeply dyed areas. So discriminatingly has the work been done that the white or lighter areas have often been removed along definite lines of separation between the two areas. Since only the stamp itself was attacked, while the paper of the envelope upon which it was stuck was not eaten, it would appear that some substance in the adhesive used upon stamps was attractive to the insects doing the work. It is apparent that a nice sense of discrimination has guided the insect in its selection of the least dyed or undyed portions. In truth a child could hardly have scraped away with greater precision these areas which the insect, doubtless an ant, has removed by depending, in all probability, upon some highly developed sense of taste or tactual sense.

A PLAY PLACE AND A VERDURE SCREENED GARAGE

Here at the side and rear of the house a tasteful mixture of evergreens and deciduous trees and shrubs guarantee green the year round.

The Little House Next Door

Suggestions for Planting the Home Grounds

By ARTHUR NEWTON PACK

NEXT DOOR to me a little house nestles amid picturesque and overhanging locust trees. It is surrounded by a neatly clipped hedge; the bricks of its chimney but occasionally peep out from between the long runners of English ivy and climbing euonymus; the bare white wall of a garage lends a background to the bursting buds of purple and white lilac, while two wonderful apple trees gnarl and twist above the back porch or frame the windows of the living room.

"Who owns that wonderful little house next door?" is the query of every stranger passing the block. "Now, that is a home I wish I owned!"

And one day two visitors came to the little house next door and said to the owner, "Would you mind if we built a house just like yours? It is going to be in the other end of town so no one will notice." The two visitors secured the plans and specifications and set to work to build. The second house was completed, and inside it was just as charming as the original. But, what a sad result! No neighbor in their block asked, "Who owns the little house next door?" For there it stood, bleak and bare, concealing its hominess behind a shining exterior of fresh white paint and green blinds.

Last month, the owner of the new home was hard at work with spade and shovel, digging holes—small round holes, large round holes and long shallow trenches—to receive the trees and shrubs which nurserymen and nearby woods had contributed.

Indeed, many lessons in plant arrangement may be learned by studying natural groupings along streams, on the edge of forests and in all pastures and woodlands. When it is possible to collect some native plants and move them to the home grounds the result adds interest and gives a more personal touch to the finished product. But the process is more difficult than simply ordering the needed plants from a nursery. It is hard work to dig wild plants and still more difficult to persuade them to start again in their new location. This is because well-grown nursery plants have been frequently root-pruned by transplanting, and have thus been forced to form an adequate and com-

pact root system which it is easy to dig and move as a whole. Plants found in field or forest all too often have several long roots extending at different angles, and if these are cut off during the digging it is probable that the plant will die for lack of nourishment. The effect of this may be largely overcome if the top is correspondingly cut away at the same time. This trimming does no harm in the case of nearly all deciduous trees and shrubs, but it is generally not desirable in the case of evergreens. Most transplanters are in such a hurry to get immediate results that they try to fool the roots into caring for more top than it is possible for them to support. When transplanting from the wild, be sure to use the pruning knife severely as soon as the plant is taken from the ground.

There are many theories of plant grouping, and many books have been written on this subject by garden and landscape experts, but one general rule finds its place in almost every work. High foundations are often the most economical and practical even if they are not the most beautiful. Do your first planting close to the walls of the house, using bushy plants which will help to conceal the brick, stone or concrete of those foundation walls, and if you can afford nothing more for years to come Nature will have wrought a marvelous transformation.

SNOWBALLS AND BUSH HONEYSUCKLE

When spring comes we love to see a riot of variegated bloom and taste the air full of the fragrance of blossoms innumerable.

And now we come to the difficult question of deciding what to plant. In winter, when the snow lies thick upon the evergreens, one is led to wish that all the lawn and garden were planted with spruce, pine, hemlock and the like. When spring comes, with the glory of drooping forsythia in the neighbor's yard, followed by the beautiful deutzias, mock orange and althea, we wish in turn that we might have a riot of variegated bloom; and then, the long summer months creeping into fall, when bright-colored berries and brilliant bark of red and yellow hues delight the eye. We want that, too.

I know an evergreen enthusiast, whose door-

yard is a beauty spot in winter, with snow upon the spruce and pine, with gold and bronze tints upon the Chinese arbor vitae and retinospora. In early spring the hardy evergreen azaleas belch out in flame to yield, in turn, to the pinks and lavenders of rhododendron and the creamy white of mountain laurel. Sometimes I think that his home yard is the best of all.

My neighbor on the other side specializes in flowering dogwood, whose glowing pink, in nursery grown varieties, blends with the pure white such as we all have seen on woodland landscapes.

There is the Christmas holly (*Ilex opaca*), native as far north as Long Island and growing in protected places throughout southern New England and westward to Cincinnati and St. Louis. It is a handsome plant which will eventually and with patience become a large tree. At first, my neighbor planted only one and wondered why no Christmas berries appeared. He soon learned that the pistillate or berry-bearing holly will not fruit unless there is a staminate tree nearby. The next year his holly tree had company, and all was well.

Others love equally well the mountain ash, with its deep orange berries remaining well into the winter and its white flowers in early summer. The European species is the most common one in cultivation but, except on the coast of New England and in the Puget Sound region, is not as good as the American variety.

A ONCE UNSIGHTLY PLACE MADE BEAUTIFUL

Here the hedge separates the lawn from the stream while the climbing roses on the bridge and garage furnish attractive color.

It is interesting to note that the real flowers of the dogwood are quite insignificant, it being only the beautiful pink and white bracts which delight the eye. The flowering dogwood is indeed a boon to the home planter, for in the fall its red berries come to take the place of the blossoms which are long-since gone.

Another group of small trees and shrubs which

DO YOUR PLANTING CLOSE TO THE WALLS

Bushy plants help to conceal the brick, stone or concrete of these foundation walls and effect a marvelous transformation in the appearance of the house.

are showy in late fall and early winter is the euonymus. The native species is the most useful and ornamental, but unfortunately the European species has been most readily procurable and it does not seem to be so well adapted to our climate. The showy fruit of these plants consists of a purplish angular seed pod, which ultimately splits open, exposing the orange or scarlet berry hanging within. The common burning bush or Wahoo of our western states (*Euonymus atropurpureus*) is one of the good species, the berries being orange. The foliage turns pink and red in autumn and hides the berries until the foliage drops, but the fruits hang on well into the winter.

Another large group of plants beautiful at all seasons is the wild roses. Perhaps the most popular and most widely known is the rugosa or ramanas rose. This is attractive because of its heavy rough foliage which hangs on well towards spring. The usual form has deep rose-colored single flowers, while there are other varieties equally good bearing white flowers. Most of the hybrid varieties are less attractive in winter, lacking the attractive haws.

In addition to the trees and bushes already mentioned there is the dwarf euonymus which is useful for a low under-shrub, growing from one to three feet high and bearing the characteristic fruits of this family.

Another member of this family is a vine which can be used in place of English ivy, and is hardier farther north than the ivy will grow. This is *Euonymus radicans*, an evergreen plant which in some forms bears orange-colored fruits. The viburnum, especially the *Viburnum americanum*, or high-bush cranberry, is one of the best known home-planting shrubs in the northern states. The European form of this plant (*Viburnum opulus*) is the parent of the common viburnum known as snowball. The American variety lacks the snowball appearance of the flowers but has the added attraction of red berries in winter.

Many people believe that there is nothing which adds more to the appearance of the home grounds than a hedge. Privet is one of the most common plants used for this purpose and very easily propagated from cuttings. Then there are the barberries, and, for evergreen effect, hem-

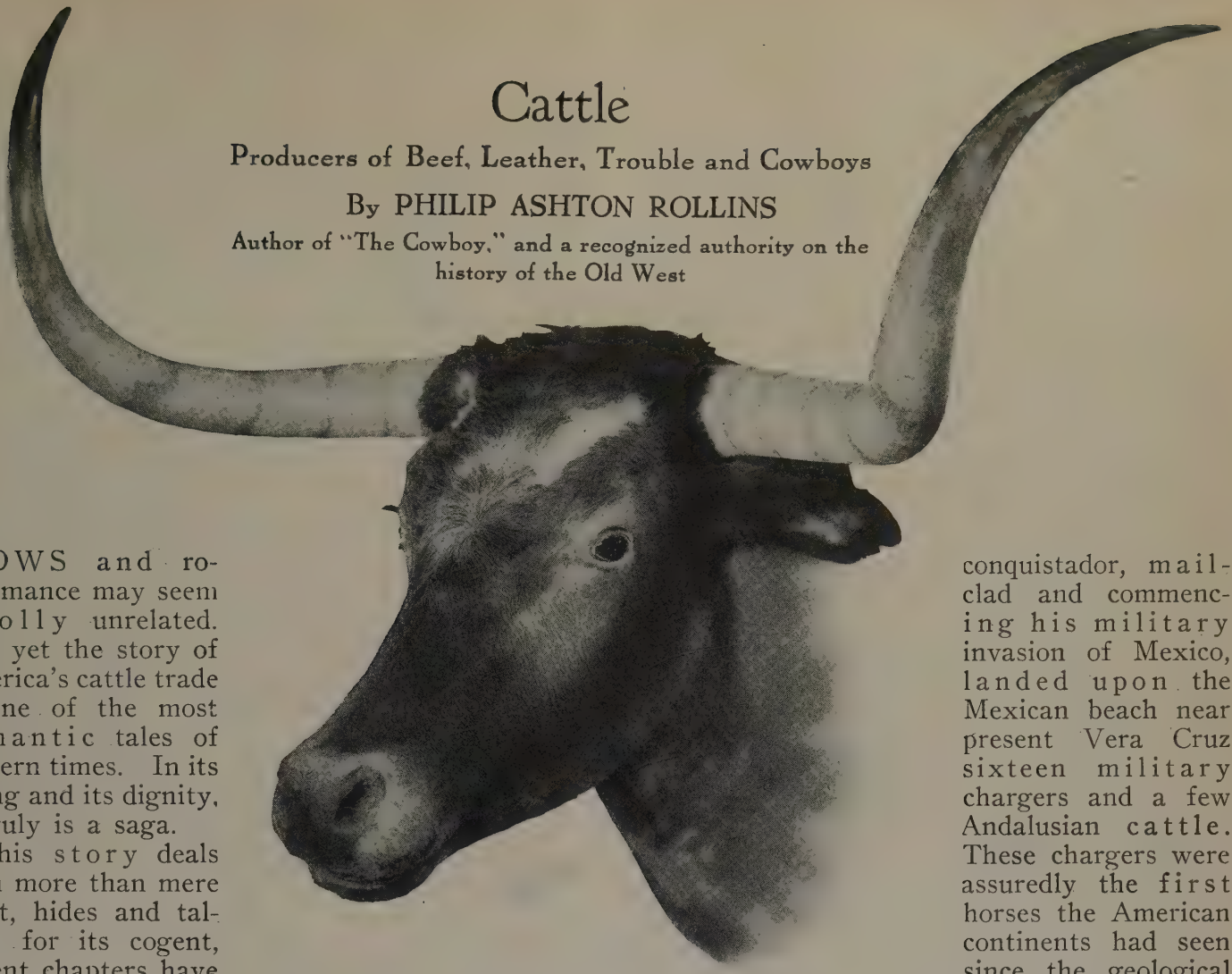
(Continued on page 245)

Cattle

Producers of Beef, Leather, Trouble and Cowboys

By PHILIP ASHTON ROLLINS

Author of "The Cowboy," and a recognized authority on the history of the Old West



HEAD OF THE REAL LONGHORN AS HE WAS

The curved and twisted horns of the early herds marked them apart from the breeds of today.

COWS and romance may seem wholly unrelated. And yet the story of America's cattle trade is one of the most romantic tales of modern times. In its swing and its dignity, it truly is a saga.

This story deals with more than mere meat, hides and tallow; for its cogent, salient chapters have as much to do with men and their achievements as with animals and their products. It is concerned as much with the cowboy as it is with beefsteak.

It begins by reciting the doings of a Spanish knight in armor. It continues with accounts of Indian conflicts, of range wars, of bravery and of cowardice, of heroic generosity, of sordid thievery, of gentleness, murder and sudden death, of the thousand and one things that happened upon America's frontier and in the lonely wastes beyond. It tells of men who, raising live stock, not only provided foodstuffs for a nation but also shaped materially that nation's social and political thought.

The cattle now in America have come from two parent sources, of which one was the Mexican herd of early and dramatic origin; the other was a second herd that, at a later period and in more commonplace fashion, was created upon the Atlantic coast through piecemeal importation direct from Europe.

On March 4, 1519, Hernando Cortes, Spanish conquistador, mail-clad and commencing his military invasion of Mexico, landed upon the Mexican beach near present Vera Cruz sixteen military chargers and a few Andalusian cattle. These chargers were assuredly the first horses the American continents had seen since the geological Ice Age; and these cattle were, with little doubt, the first cattle upon which those continents had ever looked. Not one of the countless, prehistoric, native-American horses had survived the Ice Age. And, from the Ice Age until that day in 1519, not a single horse had stepped upon the soil of either North or South America. As for cattle—from the creation of the world until that day in 1519, there had been, so geologists insist, no cattle, not even one single cow, upon either of the American continents.

Immediately after the first military thrusts of Cortes' little army, small reinforcements of men and animals arrived from Spain. But presently Cortes' men resolved themselves from soldiers into Mexican settlers; and, diverting their animals from the prior goal of war and to more prosaic uses, set up the business of raising live stock. Thus ranching was initiated in the western hemisphere. To the ranches so set up were attracted from Spain a few more men, horses and cattle.

With successive generations of men and animals, the herds of live stock vastly increased in

number and in size. Strays from these herds wandered off to self-selected ranges and became, according to their kind, so-called "wild horses" or "wild cattle": so called despite the fact that all the "wild horses" and "wild cattle" in America's Wild West were lineal descendants of the domesticated animals which Cortes, his associates and followers brought to present Vera Cruz. The animals had no other ancestry, unless, in the horses' case, a few forbears be found amid the little band of chargers which De Soto's heartbroken soldiers turned loose upon the Mississippi's western bank in 1542. Thus the mustang, and both the cowboy's bronco and his "Longhorn steer" hark back to Cortes.

By the year 1821, the ranches and the animals had multiplied to such extent that present Mexico was fully provided; while, in what are now New Mexico, southern California and southeastern Texas, were well-established ranches, each immense in acreage and in extent of live stock ownership. In the vicinities of all these ranches, and throughout the entire section that ran far to the northward from the Texan establishments, there ranged myriads of masterless "wild cattle" and "wild horses." The ranches themselves were all of Mexican ownership. Americans, or, in other words, citizens of the United States, had not as yet adventured in the ranching business.

In the year 1821, there began to trickle into the southeastern part of present Texas a scant rivulet of pioneers who were of Scottish and English descent and of prerevolutionary American stock, who were quitting their homes in Mississippi, Alabama, Tennessee and elsewhere in the lower valley of the Mississippi River, and who, more or less aimlessly, were wandering westward. These pioneers, stumbling upon the establishments of Mexican ownership, and well pleased with what they saw, settled amid the ranchers they had unearthed, provided themselves with an ample supply of branding irons, sallied among the "wild cattle" of the neighborhood, burned on them marks of legal ownership, and presently found themselves in the class of "cattle kings."

Year after year, additional people flowed into Texas from the eastern states; and soon Texas became well bestrewn with ranches of American ownership and possessing, in the aggregate, an enormous number of cattle. But there was only an occasional and limited market for these cattle. To the south lay the waters of the Gulf. Westward were, at the map's bottom, Mexico with its excess supply of live stock, and, at the map's top, mile after mile of uninhabited prairie, and then the scant Spanish settlements in far-away present New Mexico and California. Northward lay the great plains, peopleless save for marauding Indians, Indians that virtually blocked all egress. Eastward, where the desired consumers lived, there was no route, for, between Texas and the Mississippi River, there was such unfavorable topography and such comparative scarcity of proper forage as to forbid the transit of large herds upon the hoof. No railways as yet crossed that gap.

THE TYPE OF THE WESTERN RANCH TODAY

Note the loss of twist in the horns of this part Longhorn and part bald-faced Hereford.

Thus Texas had to wait for an outlet, but none developed till after the Civil War. Until the outlet came, Texas may have failed to make a profit; yet the nation did not suffer, inasmuch as the animals in the eastern states met all its needs.

During the many years before the outlet came, the years beginning with the settlement of America's original thirteen

Photograph by Chas. J. Belden

ON HIGHLAND PASTURES

The succulent grasses of the high mountain ranges of the nation's vast Forest Reserves, afford ideal grazing grounds for millions of cattle.

colonies, continuing through the merger of those colonies into the United States, and extending to a time long afterward, the population had enlarged so slowly as to cause the public no difficulty in obtaining from eastern sources a sufficient quantity of cattle and cattle products. The farming area had gradually expanded, spread westward from the Atlantic coast, and pushed with united front into the wilderness. The farms had markedly increased in number and in quantity of output.

Presently, however, immigrants began to arrive in hordes. People multiplied in number more rapidly than did the farmers' cattle. The East had outgrown its own resources and was driven to seek new fields of output. Wherefore it appealed to Texas and to the Far West, and there it found a solution of its problem, a solution in the form of long-horned, wild-eyed beasts.

But these beasts were as yet immured in Texas, and an outlet for them had to be created. Accordingly, after the close of the Civil War, the Federal Government swept the Indians from off the plains and on to reservations. Coincidently began the era of western railway construction. Tracks pushed into Kansas, and lengthwise of Nebraska. They reached Wyoming in 1867 and two years later had spanned the continent. The removal of the Indian menace and the building of the railways not only opened an outlet for Texas but also made available for all live stock the vast grazing lands that extended from Kansas and Nebraska on the east to California on the west, from Canada on the north to Texas on the south.

Into this huge area poured men and animals from the eastward and from Texas. The animals thus coming from the eastward were of ordinary,

barnyard type, descended, as they were, from the brutes which the colonial settlers of the Atlantic coast had brought from Europe and had ever kept in at least semi-domesticated state. The animals coming from Texas, descendants of "wild cattle," close blood relatives of the bulls of the Spanish bull-ring, were the so-called "Texan Longhorns" and were well-nigh wild in fact. They were as elusive as the antelope, almost as fierce and dangerous as the grizzly bear. They were as fleet of foot as was a ridden bronco, and they rushed, head down, at every man on foot they saw.

The inpouring of animals from across the eastern border was short-lived, for the supply of surplus breeding beasts in that locality was limited. But Texas had no such handicap. Moreover, she had discovered that the north was more generously watered than was the south; that, while her climate, by omitting frigid weather, produced a high birth rate and a low infant mortality, her native grasses were less fattening than were those of the continent's central and northern reaches. Wherefore she began, and for more than two decades continued, to drive annually "upon the hoof" and along now historic trails numerous herds of cattle which, starting from Texas, trudged, through weary, dust-clouded miles, to the northern ranges, there to eat to fatness and then, as "beeves" of quality, to move on by rail to the abattoirs of Chicago, Omaha, and Kansas City and be transmuted into steaks, hides, glue, hair brushes, bone buttons, sand paper and the countless other products which the packers' efficient ingenuity had devised. However, not all of the Texan output was given the privilege of eating northern grasses. Many beasts went, part of the way on foot, part of the way by rail, direct from ranch to slaughter house.

CATTLE TRAIL OF YESTERDAY; FLIVVER ROAD OF TODAY

Herds really trekked over this trail in Colorado, but fences now border it and motors travel it.

The commingling of animals upon the northern ranges produced an interbreeding of the beasts of Texan origin with those of eastern ancestry; and

SOME OF A "GRADED UP" HERD IN PEN

The white faces show a lessening of the Longhorn blood and an increase of the bald-faced Hereford strain.

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THE PULLMAN CAR OF OLD RANCH DAYS

One of the stage coaches that we all know at least from fiction or film.

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Photo by author

TYPICAL LONGHORNS IN SHIPPING PEN

The fellow in the center is "on the prod," meaning charging a person on foot. He completed this charge by knocking two slats out of the fence.

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breeds have come. But, of all the imported animals, the most picturesque has been the Brahmin. Brahmins are the sacred cattle of India. A number of them were brought to Texas with the expectation that, if crossed with the local "Longhorns," there would result a strain which would be peculiarly able to resist insects, disease, warm climate, would be able, in search for grass and water, to travel farther than could the "Longhorns," and would develop beasts ern animals when upon their feeding grounds. In Texas, for many years after 1821, and in the other portions of the cattle country for many years after the Civil War, but little of the land was held in private ownership. The great bulk of it belonged to government—the land in Texas to the government of that state, the land elsewhere to the gov-

ernment of the United States. The land thus belonging to government was held to await the prospective hordes of settlers who should absorb the almost countless acres by each settler's taking into his private ownership, as a grant from government, the comparatively modest holding which, for Texan realty, was contemplated by Texan law, and, for property beyond the Texan borders, was prescribed by the federal homestead law and other statutes. Until each particular tract thus passed into private ownership, it remained a part of the so-called "vacant public lands," continued to be fenceless, and was open to use by whoever cared to enjoy it. Thus all its grass and water were free to every comer. The government charged no rent. It donated the grass and water to the user. Such were the "free grass," "free water," and "open range" of western history, the open range upon which the major portion of western cattle found generous pasture for many years.

PROBABLY THE LAST LARGE TRAIL HERD ON THE MOVE

The "point" of 24,000 cattle headed for shipment from Sante Fe, New Mexico, leaving to escape the drought and marking the break-up of the range.

But, though all the grazing grounds legally were "open," only such portions of them as were within reach of water were of value to the ranchmen. Cattle could range many miles from a water hole if they could gain access to it whenever they desired; but, given grass that was more than a day's travel from any attainable water hole, and this grass was of no use to them.

Upon the vast and lonely stretches of the open range, the animals grazed with saucy independence, for, save on occasion, they were left almost wholly to their own devices. Loose upon fenceless and endless acres, the animals, as wild in instinct and habit as the deer, assembled themselves, through process of natural selection, into small groups widely separated from each other, and wandered whither they wished. Except upon a few ranches, no effort was made to grow hay or other fodder for the live stock. Almost everywhere the animals were required to search out their own forage, and this they found in the wonderfully nutritious, if apparently wilted, grasses that, in little, widely separated tufts, were scattered over the plains; and, according to their several varieties, had names such as bunch grass, grama grass, and buffalo grass.

Twice each year, the beasts, amid high indignation upon their part, were rounded-up, in order that brands might be applied to such brutes as were without them and that animals destined for immediate sale might be impounded and shipped away. The rest of the time, the cattle largely shifted for themselves, although, now and again, cowboys, "outriding" for the purpose, would swerve brutes from a patch of loco weed, fend them from a prairie fire, urge them out of a snow-clogged, foodless canyon, guide them to a feeding ground better than the one in use, or head them homeward from wanderings made too far afield.

It was principally upon the vast and lonely stretches of the open range that the cowboy lived his dramatic life, exhibited his bravery and superb unselfishness, that there occurred the Indian forays, the "rustler's" raids, the stampedes, trail

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Long-tailed Japanese Fowls

By HERBERT BEARDSLEY

JAPAN has produced nothing more novel and interesting, probably, than her breed of long-tailed fowls. The tail feathers of the specimen shown in the accompanying photograph measure twelve feet.

The introduction of the breed is said to have been brought about by a Prince of Japan, whose imperial crest was a feather. Yearly he offered a prize to the subject who would bring to him the longest feather. The greatest effort and skill were therefore employed by the breeders to produce the greatest length of tail feathers possible. At present only a few old fanciers know the secret process of successfully breeding these fowls. A few details have been obtained in regard to the method of their breeding. The particular breed is confined to the region in and among Kochi, the capital of a province of Tasso. The breed is about a hundred years old and is fast dying out. There is said to be no artificial method of making the feathers grow. All is done by selection. Moreover, one must know how to treat the birds during the various stages of tail growth. The body feathers springing from the shoulders attain a length of four feet. Two years is the time necessary to produce a full growth of tail. The tail feathers grow from four to seven inches a month, and continue to increase as the bird lives, which is usually from eight to ten years. The hens lay about thirty eggs in the spring and autumn which are hatched by other fowl. The hens are kept housed and sit on a flat perch, and are taken out only once in two days and allowed to walk half an hour or so, a man holding up the tails to prevent them from being torn or soiled. The birds are fed on unhulled rice and greens, and secret food known and prepared by the old fanciers themselves. They demand plenty of water and are wonderfully tame. The ordinary number of long tail feathers possessed by each bird is fifteen or sixteen. About twice a month they are carefully washed in warm water and afterwards dried on some high place, usually a roof. The present price is $50 for a bird having a tail over ten feet long. There are three varieties of the breed: First, white head and body feathers and tail black; second, white all over with yellow legs; third, reddish color mixed with white on body. All these, with the exception of the second variety, have black tail feathers. The owners and breeders take great pride in these birds and are constantly striving to improve the species and to grow longer and longer tails as in the second variety to improve the color.

A LONG-TAILED CHICKEN

This is a Japanese fowl with a twelve-foot tail. The secret of producing such wonderful tail feathers is known to only a certain few of a particular district.

Curious Ornamental Fish

By DR. E. BADE

FEW THINGS are so impressive and so realistic as the balanced aquarium, for this is the key which unlocks many of the hidden beauties of nature so cleverly veiled from the human eye.

With the aid of science and world commerce, many unique and richly colored fish are yearly sent from foreign lands into captivity. Many of these, at the first glance, are unobtrusive in appearance, as the small live-bearing tooth-carps. The peculiarities of others, Cichlids, for instance, consist in their parental solicitude and care of the young, while still others differ from the usual run

LEAF FISH
(Pterophyllum scalare)

The young fish of this species are suspended by threads from the under side of leaves of water plants.

of fish in that the body is not what is commonly called fish-like.

The leaf fish (*Pterophyllum scalare*), an inhabitant of the quiet bays and inlets of the Amazon, may be considered the most curious of the recently introduced aquarium fishes. A number of them floating about the aquarium offer an unusual and splendid sight. But as a rule these fish remain quiet among the aquatic vegetation, where they are almost indistinguishable in spite of their oddly shaped body and curious markings.

At the time of breeding, these creature are more lively. Their love play resembles more a battle than a courtship. The female is chased about, they fight, bite each other, let go, pass each other closely, and then the female goes to the plants and deposits its eggs while standing at an angle of 45 degrees. The attached eggs are fertilized by the male. The spawn is placed in irregular rows, is watched by the male, and is constantly provided with a fresh current of water by the adults. The eggs hatch in three days when the water is kept at a temperature of 25° C. Normally, the young hatched fish are suspended by threads from the under side of the leaves. Later the first attempts at swimming are carried out.

The young grow rapidly after attaining their eighth day. When three weeks old their bodily form begins to change from length to width as their dorsal and pectoral fins elongate. At this time the first indications of caudal fin markings begin to be visible.

Polycentrus schomburgki, an inhabitant of South American waters, and *Polycentropsis abbreviata* of Africa resemble swimming fish heads. The dorsal, anal, and tail fins of both are colorless and transparent, while the remainder of the body is darker by contrast, the body sometimes

THE SWIMMING FISH HEAD
(Polycentrus schomburgkii)

During the day these fish remain motionless against some weed at the bottom and look half decayed.

even becoming jet black. Many of these fish have markings of some unrecognized color splashed over the entire body. These beasts of prey remain quiet throughout the day, but as soon as it becomes dark, they are restless and uneasy. During the day they remain motionless on the bottom, often leaning against some weed where they might be mistaken for some half-decayed fish were it not for the ferocious gleam in their eyes which instantly betrays them. They are lively only when hunger or love spurs them on. Then, in the latter case, the male becomes surprisingly beautiful and forgets, for the time being, its voracity

in order to protect the spawn, which hatch in four days when the water is kept at a temperature of 25° C. The greater part of the fry remain three or four days around their place of birth in a horizontal position. Then they begin to swim, and they will then be found all over the aquarium as tiny black specks.

The third in this league of curious aquarium fishes is the so-called butterfly fish (*Pantodon buchholzi*). Although this fish is very peculiar and never fails to attract attention, it has one fault, namely, that it remains absolutely motionless throughout the day. It may always be found at the same spot near the surface of the water, but when twilight falls becomes more animated and lively. It is what is commonly called a flying fish, a class rarely found in fresh waters. In the present case the word "fly" is not used in its strictest sense, as the fish only shoots out of the water and glides for considerable distances with the aid of its extraordinary long fins.

It is a characteristic surface fish and often takes

BUTTERFLY FISH
(Pantodon buchholzi)
This fish shoots out of the water a considerable distance with the aid of its very long fins.

up atmospheric air. In its native waters it lives, primarily, upon insects, even shooting out of the water after them. It is possible to breed this fish, the spawn floating upon the surface of the water. The fry hatch in three days when the water is kept at a temperature of 25° C. The parents do not care for the young, and it is quite difficult to supply this lack, and then, too, they grow very slowly. The food taken by the young fry consists of living organisms, such as tiny insects which are thrown upon the water. They feed from the surface. When the fish are a little larger, they can be fed with mosquito larva and other insects.

A direct opposite to the flying butterfly fish is the climbing perch (*Anabas testudineus scandens*), which is able to walk on the land. Ever since two Arabic travelers of the ninth century reported the existence of an Indian fresh water fish which was able to walk on the land, and since it was later described by the scientist Daldorf, who saw this finny creature in a fissure of a palm tree not far from a pond, many fables, more or less mythical in character, have been invented about it, even that it took excursions into the high tree tops. Today this fish is known as the climbing perch, but modern travelers have nothing to say about such excursions and one must come to

CLIMBING PERCH
(Anabas testudineus scandens)
These fish can go overland from one pond to the other and if they don't find water can dig themselves into the mud.

the conclusion that the tree-climbing proclivities of this fish existed only in the imagination.

As the waters inhabited by these fish dry up, the existing puddles become overstocked, and as the water gradually disappears the fish leave their old home to seek other waters. They depart by hundreds, traveling over the land, scattering in all directions. Then the gill covers are fully extended and the pectoral fins spread out. The former are bent outward like a joint, the pointed ends seeking a firm hold; by a twisting and turning movement of the body, especially of its posterior part, the creature is jerked forward. Then the spines of the gill covers again seek a firm hold. In this way the climbing perch is able to move quite rapidly over the ground.

If the fish do not find water during their travels, or if they find other practically dry ponds, they will dig themselves into the mud and one can find them here at a depth of one and a half feet. The upper half of the mud has caked and is so brittle that it powders at the touch. The fish

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How Butterflies Pass the Winter

By A. B. CHAMPLAIN

Pennsylvania Bureau of Plant Industry

THE EARLIEST wild flowers have made their appearance. The skunk-cabbage blossom takes its place as the pioneer of the swamp, with the hepatica running a close second, or was it the arbutus?

A few more days must pass and the wildwood will be teeming with new life; along with the wild flowers that have emerged from their winter nap, the spring-peepers will sing their chorus in the swamp, and here and there will flash those gleams of color that represent the most popular and beautiful creatures of the insect world—the butterflies. Who will be the first to see the vanguard of this brilliant array? The Mourning Cloak will be one of the first. It is a cosmopolitan species, which, in England, is called the Camberwell Beauty, and it is indeed, a beauty, with its purplish-brown velvety wings and broad border of tan or cream color, artistically contrasting with a row of small spots near the margin. We have all seen it some time in our walks. Where do you think it has been during the winter?

VICEROY BUTTERFLY

At the first appearance of winter weather these butterflies seek shelter in barns and outbuildings, in hollow stumps and logs, beneath ledges or similar places, singly or in numbers. Here they sleep through the long days and nights, waiting for the magic touch of spring.

The first warm days of March or April lure them from their hiding places. Out they come to bask in the sun, to drink at the flow of sap on the injured tree trunk, to sip at the fermenting juice on the top of a fresh-cut stump or the moisture at the edge of a mud puddle.

Some time later they are off to the willow or the elm, where their eggs are placed. There are two broods of this butterfly in the vicinity of Harrisburg, Pennsylvania, where these observations were made. The eggs laid on the willow, elm, poplar and hackberry, hatch about the first of June. The caterpillars are gregarious, that is, there are twenty or thirty all living and feeding together very contentedly. Often they strip the branch on which they live. The full grown caterpillars are velvety black in color, with small red and white spots and rows of black-branched spines. Soon they will transform to the grayish-brown chrysalis, a jewel in itself that will hang pendant-like, until some day our butterfly will emerge.

The eggs of the second brood hatch in August. From this emerges the butterfly that hides all winter and appears among the first in spring.

There are other species that pass the winter as butterflies like the Mourning Cloak, and many that overwinter in other ways. Some species,

MONARCH BUTTERFLY

wrapped up in a leaf or in some nook or cranny, hibernate in the larval or caterpillar stage; many reach the pupal or chrysalid stage to pass the winter; while the remainder are compelled to depend upon the resistance of the eggs to brave the winter cold. Thus it may be seen that a great complication of habits is possible in the butterfly world. Each kind adheres strictly to the practice of the species; that is to say, if the Mourning Cloak passes the winter season in the butterfly state, so will its progeny pass the winter in the same state. If another butterfly passes the winter

in the egg state, in like manner will its children pass the winter in the egg state, and so on for countless generations; likewise another species, the Viceroy, may overwinter in the caterpillar state, and so on as the case may be.

MOURNING CLOAK BUTTERFLY

One species, the Monarch, or Milkweed Butterfly, goes south for the winter. During the latter part of September and in October, they gather in vast swarms, mount into the air to lofty heights and, supported by favorable winds, soar to their winter home in the south. They do not return until May. This is the longest lived of our butterflies, attaining, as it does, a full year in the perfect or butterfly stage. It is also one of our best known species, with brick red wings, black veins and black margins, spotted with white. An illustrated account of the transformation of this butterfly was entertainingly presented in Nature Magazine for August, 1923.

The Viceroy butterfly looks very much like a small Monarch, but a close examination will at once disclose the difference. The caterpillars feed upon the leaves of apple, plum, oak, willow and many other shade trees and shrubs. This insect hibernates or spends the winter in the caterpillar state. A folded leaf carefully spun together answers as a house, and it remains in this snug retreat until June, when the butterfly appears.

Who will see the first Mourning Cloak, the Hop Merchant, the Interrogation Mark, and the Comma butterfly? All are very early forms. Then the Red Admiral known to most everybody, the Orange Tip, Painted Lady, American Peacock and Monarch? And finally, the Hair Streak, Coppers and Skippers.

Curious Ornamental Fish

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generally lie in a moist layer of soil, but this can even dry up without destroying the life of the creature. When the ponds are again filled with water after the first rains, the climbing perch works its way out of the mud and lives in the water as usual.

THIS FISH SHOOTS ITS PREY
(Toxotes jaculator)
It lives in India and shoots insects with a drop of water hurled from its mouth.

The climbing perch can be bred in water kept at a temperature of 26° C. The spawn is attached to the under surface of aquatic plants and about one inch above the soil. About two hours after being fertilized, the eggs are detached by the current set up by the adults. They then rise to the surface and hatch in from two to three days in sunny weather. The young fry are marked by black bands and grow quite rapidly.

It may be of interest to mention, in conclusion, that in India a fish has been found whose food consists of insects which are first shot with a drop of water hurled from the mouth. Although this extraordinary fish (*Toxotes jaculator*) has not, as yet, been introduced into this country as an aquarium fish, it has, at various times, been kept in captivity by European aquarists and has given ample proof of its accurate marksmanship.

Camp Nature and Nature Camps

By ANNIE T. WASHBURN

THE BLUSTERING winds of March have whirled and twisted into every crack and corner, and now April rains will finish the cleansing process until even the dweller in the most congested city will be conscious of the spring awakening. The fresh clear air, blue sky with white clouds racing above, awake in the soul of even the shut-in the desire to seek the open country. Trains, trolleys and automobiles will soon bear the Saturday afternoon and Sunday pleasure seekers countryward, be it toward park, seashore or forest. With these first fresh invigorating days of real spring the urge toward the out-of-doors is universal, and the first stretch in the open only "whets the appetite for more."

According to our inclinations and pocketbooks we will soon begin to plan for the summer vacation.

In the summer more than one hundred thousand boys and girls in these United States lead an organized camp life. Many thousands more, members of Boy Scout troops and Girl Scout groups, camp and tramp in the out-of-doors. Stretching from coast to coast are more than twelve hundred camps for young people, building sound citizens and forming a movement the full significance and possibilities of which are only beginning to be appreciated.

Charles W. Eliot, that fine citizen and president emeritus of Harvard University, has termed the organized camp movement "the most important step in education that America has given to the world." Realizing their responsibility, camp directors and counsellors have formed national organizations the better to exchange views, discuss problems and direct their work. The movement is going forward on a sound basis.

Recreation and physical benefit were the original ideas behind the early camps. Inevitably this was expanded. In the water there were fish. All about

were trees, flowers and ferns. In the trees and on the ground was wild life. The camper was a citizen of this out-of-doors, a fellow-dweller in the Community of Nature. An inquiring friendship with all the other members of the community was natural, and education became linked with recreation in the growing movement.

So the parents of today have come to realize that a life close to Nature makes sane, clear-minded men and women of our boys and girls. They know that two months of the year spent sleeping in tent or cabin, breathing the clean perfume of the open, tramping the wooded trail, swimming and paddling, eating simply to satisfy an appetite that needs no tonic, are mental and physical investments in manhood and womanhood.

SWIMMING TAUGHT BY CAPABLE INSTRUCTORS

Is a feature at many camps where the children learn to swim so well that many pass life saving tests.

Thus a demand has been created. It is a demand for camps well situated and ably directed, with proper counsellors and a sanely balanced program. It is a demand for an experience for boys and girls that will teach them clean, natural living; develop powers of initiative; foster observation, courage, self-control, thoughtfulness, physical well-being, and, through these, equip our young people to face squarely the problems of later life.

The demand is being answered by enthusiastic and thoughtful men and women. While New England is the camp-ground of today, there is a growing belt dotted with camps stretching across the northern states. The majority of these are doing the work well. Some could be, and are being, improved as experience and study show the way. A few could as well be dispensed with in the interests of the healthy future of the camp movement.

Camps cannot be standardized. Physically, they depend upon their situation and their builder. For what they accomplish they must draw upon the inspiration, thought and sound enthusiasm of the director or directress. The more than twelve hundred camps of the present vary widely. There are a few that partake of the country club idea, with cabins equipped with hardwood floors and shower baths. At the other extreme are a few badly placed and inadequately equipped. In between are the many with rough, homey cabins or tight, clean tents; with camp life run on a definite program; with leaders, who, knowing, can impart.

Situated with Nature all about, camps are provided with the most essential stimulant to knowledge — the presence of things worth knowing about. A hike in the woods, with a night spent in the open or on the mountain, teaches the campers self-reliance. On such a trip can be garnered a knowledge of the clouds, which one means rain and which wind. The camper learns how to sleep comfortably despite the night's dew and the breeze that may spring up; how to seek out the shelters of Nature; how to cook a campfire meal.

There are many intimate secrets of Nature, of trees, of wild life. Let the camper become interested in a plant or a creature and know how it meets the problems of its wild existence and there is created a natural protector and friend. Nature becomes a friend to be cultivated, not an enemy to be overcome or something merely to be used.

Camp directors are meeting these natural demands of their youthful charges in many ways. They are developing a very definite campcraft. They are weaving the summer camp into the fabric of the educational system.

Administration of a girls' camp must differ somewhat from that of one for boys, but fundamentally the work is similar. Athletic activities,

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THIS HOME IS ALL THEIR OWN — Photo by William L. and Irene Finley

An early fall scene at Lake Merritt, Oakland, California, when wild ducks begin to collect. They seek this refuge where guns are unknown, after the opening of the hunting season. Later the flocks number five to six thousand, containing at least eight different species of ducks.

A Municipal Camp for Wild Ducks

By WILLIAM L. and IRENE FINLEY

Of the National Association of Audubon Societies

(Photographs by the Authors)

WE HAVE often thought if we could interpret the quacking of the wild ducks that cut south along the highway of the clouds during the fall migration or get the drift of their conversation around some of the lay-over ponds and lakes in the land that borders the Pacific, we should hear a good deal about the free camping grounds at Oakland, California. From the wild duck's standpoint, the broad highway in the sky is far from safe, even though every feathered wayfarer has the well-known warning "Safety First" on the tip of his bill. When the tourist movement starts among the northern flocks, the shooting season opens and duck accidents are appalling. The joy in journeying to Oakland is not only to reach a zone of safety, but ducks, like people, are fond of a place where the table is always spread and the meals are free.

As we stood on the shores of Lake Merritt in the very heart of Oakland, we watched the ducks arriving at this southern watering place. A flock of pintails came over, flying high. They circled twice and tobogganed to the shallow water near shore. They quacked and ducked and shook their tails, sat up in the water and fanned their wings like children clapping their hands in play. Any sportsman knows that a pintail gets mighty nervous and wary when he hears the crack of a gun. It would have been impossible for us to get anywhere near these birds on the open waters of the Sacramento. Yet, as we stood quietly on the bank, they waddled up the shore, took a drink from the concrete basin and fed along within twenty or thirty feet of us and within a short distance of the chugging, honking line of automobiles. Here are conditions and an environment where wild ducks grow tame as if by the wave of a magic wand.

Lake Merritt is the oldest state game reservation in California. It was established by an act of the legislature in 1869. While it is less than a mile square, it is safe to say that this small body of water is better known in the duck world along the Pacific Coast than any other resort. Years ago the city parked the area around the lake and built a wide curving boulevard. Beyond are fine residences, and then comes the sky-scraper district. The lake and the lawns are attractive. This appealed to ducks as well as to people.

If an old canvas-back once winters in this balmy glow of California cordiality and gets back home in the north, he generally brings, not only his own

family the following season, but all his neighbors. The news about this place where guns are unknown spreads to the far ends of the most distant ponds up north. Free lunches with cement drinking basins are not common in a duck's world of danger. While there is plenty of water in the lake, it is fed by the tides of salt water from San Francisco Bay. The sea ducks thrive on this, but the river ducks flock around these drinking basins of fresh water that are supplied by the city.

This municipal duck boarding house requires five or six hundred dollars' worth of grain and a man to scatter it during the tourist season. Nothing warms the heart of a Californian like welcoming visitors from all sections, and he glows with ecstasy when the visitors pay their bills. Of course, in the case of the ducks, it is not currency or checks. But you can depend upon it that both old and young citizens of Oakland reap their harvest of pleasure in this big open air museum in the heart of the city. The school children who hold a spring festival, dance on the lawns and feed the ducks, the endless line of traffic that carries innumerable visitors past the lake, the tired business men and women who need relief from cares — all cash their coupons of joy as they watch the wild fowl population around Lake Merritt. At a small yearly expense, the city fathers are building a love of nature into the fiber of their citizens that is lasting and worth while.

Photo by William L. and Irene Finley

TAME UP TO TEN FEET

The Scaup or Blue-bill that spends the winter at Lake Merritt and allows the camera man to shoot at a distance of ten feet.

Photo by William L. and Irene Finley

WARNING TO KEEP OFF

The Municipal Camp ground for wild ducks at Oakland, California, where free lunches are served by the city. Pintails in the foreground.

As we stood at the edge of the pavement watching widgeons and pintails dozing on the lawn in great numbers, we heard the remarks of the passing public. "Where do they all come from?" "How tame and contented they are!" A young man stepped up and said, "I wonder how many I could pot at one shot?" "It would be a crime to shoot into that bunch," answered his companion. In an hour, four people with cameras stopped to take pot shots and they all went away with full bags that will satisfy the mental appetites of themselves and their friends for years to come. On the northeast side of the lake a large section is roped off both on the water and the grassy slope. Here is the sign, "This space reserved for the ducks." This, of course, cannot be read by the ducks, but it is needed for humans. The ducks keep on their side of the ropes. If they were like chickens, they might bother their rich neighbors who live nearby. The quacking of the pintails and the whistling of the widgeons are songs of wildness full of far more meaning than the street chatter of English sparrows.

When the fall hunting season opens, the pintails or sprigs and the baldpates or widgeons are among the first to arrive in October and they stay till February. The canvasbacks come in later and stay till the first or middle of March. These varieties predominate. There are also spoonbills or shovellers, scaups or blue-bills, buffle-heads, golden-eyes and ruddy ducks. American coots or mud hens are abundant, and there are always a few grebes. These species have diverse feeding habits, and would seldom all be found together. But here the rare combination of abundant and attractive food, pure water, and, best of all, freedom from the ceaseless fusillade which has greeted them at every stage of their journey of hundreds of miles from their homes in the north, make the resort so attractive that nothing but the approach of the nesting season could make them wish to leave.

Arbutus

By Prof. A. A. HANSEN

AFTER that first terrible winter in New England, one of the first sights to cheer our Pilgrim forefathers during the early spring days was arbutus, the "sweetest flower that grows." The dainty blossoms were hailed as a symbol of hope, a promise of the better things in store after the tortures of that dreadful first winter. Tradition relates that the early Pilgrims were so overjoyed at the sight of the charming plant, the blossoms of which seemed to appear from under the winter's snow, that they called it the Mayflower. In the words of the poet Whittier:

"God be praised!"
the Pilgrims said
Who saw the blossoms peer
Above the brown leaves, dry and dead,
"Behold our Mayflower here!"

"THE SWEETEST FLOWER THAT GROWS"

So was the arbutus named by the Pilgrims, for they hailed it as a symbol of hope after their dreadful first winter.

The true Mayflower, however, is an English plant, neither resembling nor related to its native American namesake. Whether the American species was named in tender remembrance of home ties in England, or in honor of the sturdy vessel that carried our forebears safely across the ocean, is not known. The name Mayflower is still in common use throughout New England, although in other sections the plant is usually called arbutus. The name Mayflower is hardly appropriate, since the flowers are among the earliest of spring blossoms and comparatively few remain during May. Neither is arbutus particularly appropriate except for the beauty and euphony of the word, since the true arbutus is also an English species that is not even closely related to our beautiful plant. Our native arbutus may be found in sandy or rocky soils, particularly in pine woods and under evergreens, from Newfoundland to Saskatchewan in Canada, and in the United States from Maine to Florida, and westward to Kentucky and Wisconsin. Its sweet-scented, waxy-white or delicate pink blossoms usually follow the melting snow. Arbutus is a trailing plant, as the scientific name *Epigaea repens* suggests, the name meaning literally, "trailing on the earth." The flower-clusters spring at intervals from the creeping stem. It is difficult to describe the floral structure, since the flowers seem to be in a transition stage in which a variety of forms may be found. Those that may be described as staminate or male flowers are betrayed by the yellow pollen dust which is quite conspicuous on the white or pink background formed by the corolla. The creeping stems are slender, woody, tough and hairy, while the leaves are evergreen, somewhat leathery in texture, oval in outline and have a rusty appearance after being exposed to the rigors of winter. Soon after the flowering period is over, however, the brighter olive-green new leaves appear. The upper surface of the leaf is smooth, while the under surface is somewhat hairy and of a lighter color. The leaves and stems seem to delight in hiding under the mat of dead leaves that covers woodland earth like a mat during early spring, and we would usually miss the plant entirely were it not for the protruding bouquets of dainty clustered blossoms. It is necessary for the

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YOUNG TREES AT AMHERST, MASSACHUSETTS, NURSERY

About 500 seed beds containing from 3,000 to 15,000 seedlings each.—White patches are buckwheat, sown every two years and ploughed under in the fall.

The Nursery: Forestry's Show Window

By RICHARD W. WESTWOOD

NURSERY: Blue bunnies hopping after blue tortoises on a white background. Brightly pictured nursery rhymes. Diminutive furniture. Proud and friendly dolls. Building blocks and tin cars running on a tin track.

Probably this is what the illustrated dictionary of the mind pictures when the word nursery is used. It is a fine sort of nursery. But there are other kinds, important and dedicated to youth as well. In these it is youthful trees.

In the blue and white nursery the minds of the youngsters are first shaped; taught to observe, construct, investigate and grow. In the outdoor nursery, decorated with the blue of the sky above and the white of the snow in winter, the young trees are prepared for life; taught to be erect, strong and fair. So, after all, it is not such a far cry between the two, and the word nursery fits happily the early home of future forests.

As the rolling snowball of public opinion has gradually picked up more and more sentiment that recognizes the need of foresting for the future, governmental nursery activity has leaped forward. While natural reforestation takes place in some of the cut-over areas, new trees cannot be wished out of the soil of the bulk of the eighty-one million denuded acres of forest land that we are carrying on the red ink side of our economic ledger. Systematic planting must turn the trick.

So far the planting of stripped lands compared with their extent, and the rate of logging off other resources, bears about the proportion of the peanut to the elephant. Government, private owners, pulp and wood-using industries and other agencies are planting about thirty-six thousand acres a year. The area planted to date is about a million and one-half acres. Thirty-six thousand into the remaining denuded acres is simple arithmetic; dividing acres into acres and getting the answer in years, to wit, 2,250 years at the present rate.

In the growing nursery activity, however, lies promise. The Federal Government has five forest nurseries, capable of planting 7,500 acres a year. With them they are tackling the problem of reforesting the million and one-half denuded acres of land in the National Forest Area. This work demands virtually all the output of the federal nurseries.

Commercial nurseries supply practically all of the public demand for shrubs and fancy trees. Few of them go largely into the business of supplying seedlings or transplants for reforestation work. There are a number of cities maintaining nurseries, but the bulk of their output is for shade tree and highway use, or for watershed planting around the local reservoir.

It is by the states, then, that the outstanding forest nursery activity is being carried on. About one-half of the thirty-two states that now recognize forestry as an organized job of government have official state nurseries. Several of them have plants for the growing of young trees for experi-

mental purposes in connection with the agricultural college or forestry school. Their value for reforesting and for supplying the public demand is small.

New York and Pennsylvania appear to be engaged in some friendly competition in forest nursery activity. Massachusetts is close on their heels. California, Wisconsin, Michigan and Kansas are the three other particularly active states. Maine, New Hampshire, Vermont, Kentucky, Maryland, Indiana and Ohio have laid substantial groundwork with smaller nurseries. State foresters in other states are hoping for liberal handed legislatures so that they may get under way.

The State of New York, with about four million acres of land that are not but should be growing forests, shipped more than eight and one-half million trees from her nurseries during the past year. The state has a total developed area of 205 acres for starting young trees on their way through life, and has what is believed to be the largest nursery in the world at Saratoga. The trees are being furnished at cost at prices from one to five dollars per thousand, or free when the trees are to be planted on publicly-owned land. The 1923 shipments were double those of 1922.

"The large number of individual landowners who are beginning to reforest waste land on which they have been paying taxes and from which they have no return, shows that interest in the reforesting movement is spreading rapidly throughout the state, as the possibilities of planted forests become better understood," says Alexander Macdonald, Conservation Commissioner. The large increase in the size and number of plantations that are being made by municipalities and the fact that some of our largest wood-using industries are laying out nurseries of their own to furnish their young stock, are further indications of the widespread interest in the movement."

Pennsylvania has three large and one small nursery for youthful forest trees. Nine other small nurseries are maintained in cooperation with state institutions. From all of them, which are shown to contain about thirty-three million trees, some ten million will be available for planting during this year. It has been the experience in this state that three-quarters of the private demand for trees from the state nurseries comes from farmers. Coal companies, water companies, pulp and paper companies and railroads do most of the rest of the planting. And still the number of trees to be had is unequal to the demand for them.

With six nurseries and a definite program of expansion, Massachusetts is foster parent to about fifteen million trees. Two million of these are four-year transplants, which is the only nursery product sold. Experience has shown that they stand the best chance of a long and sturdy life. Without any advertising whatsoever, the Conservation Commission has received requests for trees far in excess of the demand.

General interest in tree planting is high in the Bay State. There is, also, a strong movement for the creation of town forests. In addition, the state is acquiring about twenty thousand acres of forest land a year. These factors combine to make a heavy demand on the output of the nurseries, and

BUCKEYE
(Aesculus glabra.)

SEEDLINGS
HICKORY
(Hicoria cordiformia)

Courtesy New York State College of Forestry
WALNUT, WHITE OR BUTTERNUT
(Juglans cinerea.)

Courtesy New York State College of Forestry

SEEDLINGS

RED OAK (Quercus rubra.) | BEECH (Fagus americana.) | WHITE ELM (Ulmus americana.) | SILVER MAPLE (Acer saccharinum.)

a definite aim has been set as a result. Within a short time it is hoped to bring the total capacity of the nurseries up to twenty million trees, producing between four and five million transplants a year. One-quarter of these would be sold to the public at cost, filling orders as they come in; another quarter would be set aside for free distribution to towns setting up their own forests; and the remaining one-half would be held by the state to reforest its own areas. The average shipments from the nurseries in the past have been about 3,000 trees each, the demand coming from the small farmer and landowner.

Thirty acres are devoted to the nursery maintained by the State of California. Thus far it has been possible to raise stock in excess of the demand from the public. It is expected, however, that when the general public finds out that the stock can be obtained at a low price compared with commercial nurseries there is going to be a boom. Windbreak, shade and fuel plantings are expected to be extensive.

Wisconsin has one forest nursery at Trout Lake in Vilas County, seven acres in size and capable of producing about one million trees when working at capacity. Kansas devotes forty acres at Hays to its forest nursery work. It supplies trees at as near cost as possible, and most of the large commercial nurseries offer forest trees within the economic pocketbook. Michigan has an annual output of about four million trees from its nursery, selling the product to the public at cost.

In New Hampshire work is now going on enlarging the present state nursery with its capacity of a quarter of a million trees a year. The public demand for trees is very far ahead of the supply, and the forestry department does not dare do anything to stimulate it further. Ohio started her nursery work in 1922 and has an annual output of 225,000 from forty acres, with a goal of two million and one-half not far removed.

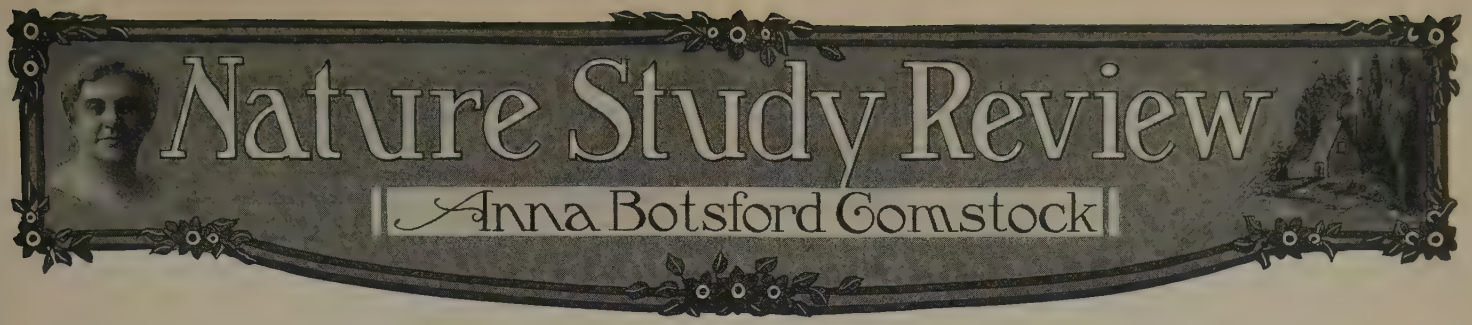
One hundred thousand trees were planted in Maryland during the past year, tracing their ancestry to the forest nursery. Five times as many

(Continued on page 248)

Courtesy New York State College of Forestry

SEEDLINGS

WHITE PINE (Pinus strobus.) | HONEY LOCUST (Gleditsia triacanthos.) | YELLOW OR TULIP POPLAR (Liriodendron tulipifera.) | WESTERN OR IDAHO WHITE PINE (Pinus monticola.) | EASTERN HEMLOCK (Tsuga canadensis.)



What Is Nature Study?

"WHAT is nature study?" asks the man in the street.

"Nature study is study nature, or as the elder Agassiz wisely advised, 'Study nature, not books.' If I might presume to improve on this excellent advice I would put it thus—'study nature *plus* books,'" declares Guy C. Caldwell of the University of Minnesota. Mr. Caldwell goes on to say: "We all know the value of such excellent books as 'The Flower and the Bee,' by Lovell, and 'The Mysteries of the Flowers,' by Faulkner, to mention but two works, and how they inspire one to get back into the field, but to study technical works only without the field experience, is an excellent way to waste time.

"Nature study in the schools means practical study of plants and animals versus theoretical study by books only, and this kind of study should begin in the kindergarten.

"The embryonic idea of natural conservation evolves in the child mind when it is taught to love a thing rather than ignore or take it for granted.

"It is probably safe to say that there has been a greater interest and love for birds and flowers created in the minds of the boys and girls—the future men and women—in the past ten years than in the 100 years preceding this decade—thanks to the initiative of William Dutcher, founder of the Audubon Association, and the creation of such like movements. The writer was once strolling in a field with a Harvard graduate who had taught botany, but who at this time hardly knew one plant from another. He had reversed the advice of Agassiz and had studied books, not nature. In driving overland recently with a middle-aged person, my companion, seeing a potato patch in bloom, inquired what the plants were. He had not taken nature study in his day and never before had observed the interesting blossom of the common potato plant.

"How many thousands of people utilize the shade of street and park trees without giving the donor a passing thought!

"Nature study teaches the child to use its eyes; to enjoy the beauty of the cotton blossom as well as to know its economic value; to realize that the rich quality of the violin tone comes from the maple and spruce; to appreciate that the ease with which it travels over the country roads is due to the rubber tree.

"The general public, and the professional and business man in particular, is asking, 'What's wrong with the colleges?'

"The laconic observer replies, 'Too much theory and too little practice,' and does he not hit the nail squarely? Is not the theoretical college training only a stepping stone to entrance in the university of Experience, where it is up to the student to make a success of life?

"Is there not something radically wrong when the great majority of students think the essential thing is to get a degree and are permitted to leave college with the conviction that they have acquired an education? If man is a part of Nature why should he not know more of her? Nature study puts glasses on eyes that would otherwise see too dimly to observe. It teaches aesthetic as well as economic values. It enables one to get infinitely more out of life and to give more in return.

"If the thoughtless people who now carry off large quantities of mariposa lilies, columbine, fringed gentian and arbutus, had had real nature study in their school days we would now be enjoying infinitely more beauty by the wayside and be spared the pain of witnessing such reprehensible acts of vandalism as one now sees in the national parks and on private property."

A Green Tree in the Desert

By ANNA BOTSFORD COMSTOCK

UNDOUBTEDLY "tenderfoot" is meant to be an epithet of opprobrium, and no one has yet had sufficient courage to say a word of defense of those so branded; thus the writer may be the first to lift a pen in the cause, by declaring unhesitatingly that it is only the "tenderfoot" who really sees and appreciates the wonderful things in any country whatsoever.

For instance, here in the Arizona desert the inhabitants who are so accustomed to it, and even the wise ones who have studied the teeming life of the desert, cannot realize how marvelous to the eyes of the newcomer are the most common phenomena in this land of imperturbable sunshine and limited rainfall. Even the creosote bushes which cover vast areas with their yellow-green, varnished foliage seem a miracle, so evenly are they planted by the stern hand of necessity made manifest in scanty supply of moisture, and yet so glisteningly and gloriously do they flourish. However, much as we admire the creosote, the gnarled and sturdy mesquite, the weird and captivating species of cacti, one tree, the Palo Verde, has held us in thrall. Its name in Spanish means "green stick" and is a graphic term for a tree that is green from twig to trunk, delicately and eternally green through the vicissitudes of the seasons of the rolling years.

A PALO VERDE TREE

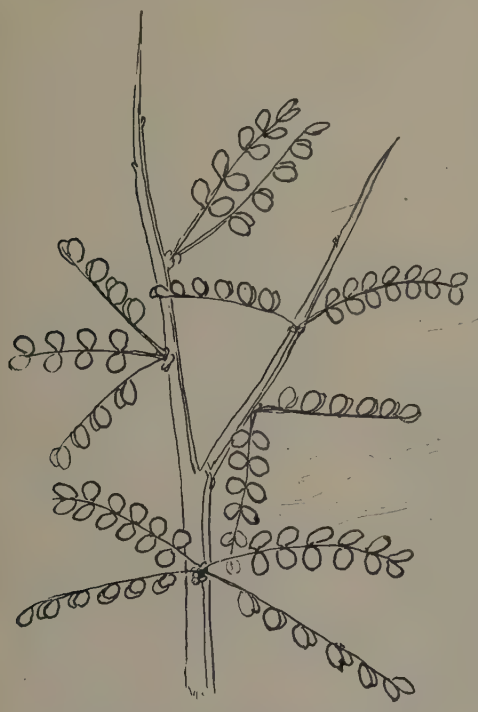
It is probable that this tree was growing when Columbus discovered America.

There are three species of Palo Verdes which the botanists have linked under the genus *Parkinsonia*, and it has been no easy matter for the "tenderfoot" to learn to distinguish them in midwinter. However, after consulting tomes in the library, and quizzing most respectfully eminent scientists, the deed is accomplished. *P. aculeata* has leaves seven or eight inches long bearing from 20 to 30 pairs of leaflets; *P. microphylla* has leaves one inch long, bearing 4 to 6 pairs of leaflets; *P. torreyana* has leaves one inch or less in length with 2 to 3 pairs of leaflets. It looks simple enough, doesn't it? The difficulty lies in the characteristic of these trees that make them most interesting to the "tenderfoot"—i.e., they distrust leaves and do without them most of the time. After the winter rains they put forth a few leaves and, when the dry weather comes, shed them promptly. Again after the summer rains in July and August they develop leaves, and again shed them when the dry season approaches. The leaves at best are so ridiculously small that one wonders why the tree is so afraid of them. However, leaves do transpire and give up moisture to the water hungry atmosphere of the desert unless they are varnished like those of the creosote, or woolly like those of the sage, or have some other water-saving device. Without leaves how do the Palo Verdes make their food and gain their growth? Their trunks, branches, twigs and even the naked leaf rachises bear chlorophyl and do the work without any such waste of water as leaves indulge in. The golden rule of the desert is: "Get all the moisture you can and keep all you get."

The Palo Verdes are like nothing we have in the east, unless one could imagine an asparagus plant twenty feet or more in height. The trunk usually divides rather low into two or three large, spreading branches which in turn divide into several irregular, rather crooked limbs that bear masses of intricate branchlets and twigs and which in *aculeata* carry the bare rachises—mid-ribs of the fallen leaflets—that give the tree a resemblance to the long-leafed pine. There it stands, an object of beauty because of its vivid greenness and fringiness which softens its outline so that the easterner classes it mentally as to loveliness with the ferns and larches.

The Palo Verdes love the warm exposures on the lower southern slopes of the jagged, rock-ribbed, tree-crowned mountains of the southwest and Mexico. *P. torreyana* is gray-green and has a liking for "the washes" made by the fitful streams of the region; but the other two, especially *micro-*

phylla, consort with the giant cactus, and on the areas where these fluted green pillars stand in stately ranks the Palo Verdes give a tint of shimmering golden green to the whole landscape.

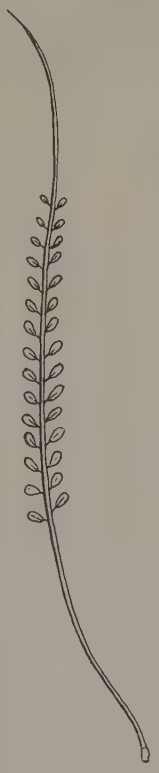


LEAVES OF PALO VERDE
(Parkinsonia microphylla.)

The Palo Verdes need to conserve the precious water they get during the winter rains for the glory of their blossom in early spring. Every twig is set for its full length with vivid yellow flowers. The upper petals of the blossom of *aculeata* has splashes of red upon it, adding rubies to the gold of its inflorescence. When *microphylla* is in bloom the desert rivals the sunset clouds above it in color. Then the name of the tree is changed from Palo Verde ("green stick") to Lluvia de oro ("shower of gold" in the picturesque Spanish language).

Not alone is the Palo Verde a thing of beauty the whole year round but it is also a blessing to the hungry when it is in fruit, for, like many of its desert companions, it is a legume. The Indian women formerly pounded the seeds to make flour for their bread, and the fruit is eagerly sought by certain four-footed denizens of the desert. The common, unpoetical name "horsebean" is applied to it as a tribute to its nourishing qualities. Despite its profusion of fruit, the Palo Verde has a struggle to maintain itself. Dr. Forrest Shreve of the Carnegie Desert Laboratory has proven that the mortality of the seedlings is very great during the severe arid conditions that characterize the early summers in Arizona. If a tree gets far enough along—that is, from ten to twenty years old—so that it can endure the loss of many twigs at this season, its life is fairly safe for many years to come. This shedding of twigs to cut down the water requirements of the plant is analogous to the shedding of leaves of the deciduous trees in "monsoon climates." Dr. Shreve has established beyond question the fact that these delicate looking Palo Verdes of the desert have the dignity of years as well. One, near the desert laboratory, was growing there a lusty seedling when Columbus discovered America; and at least fifty, in the area which he studied, were there when Father Kino founded the Mission of San Xavier del Bac in the valley below before 1700 A. D. Although in the open desert the Palo Verdes rarely reach the height of 30 feet, yet when given plenty of water they are fair-sized trees, as is demonstrated on the campus of the University of Arizona where an avenue shaded by *P. aculeata* adds greatly to the beauty of the place, and where, as if imbued with the classical spirit of their environment, their boles are wreathed with English ivy, a strange but beautiful companionship and an apparent instance of amicable and reciprocal helpfulness and understanding.

FRUIT AND LEAVES OF THE PALO VERDE
(P. torreyana.)



LEAF OF
PALO VERDE
(P. aculeata.)

Although a native of America, the *P. aculeata*, or Jerusalem thorn as it is often known, has been naturalized in many parts of the tropics. It is frequently employed for hedges, winning the name of Barbados flower-fence from its gorgeousness when put to this use. Its bark yields a white fibre suggesting possibilities for paper-making, although it is somewhat weak and short for most purposes. It does not prosper as a greenhouse flower, seeming to prefer tests of its hardiness under conditions of extreme dryness. There are three species falling under the head of Parkinsonia that are natives of South America and one of South Africa.

Interesting Children in Birds

By ALVIN M. PETERSON

(Photographs by the Author)

"I SHOULD relegate the whole subject of bird nature study to some one of the excellent books we already have," writes C. F. Hodge, "were it not for the fact that with all our books and all our birds, year by year boys and girls are passing through our schools who are not able to recognize even our commonest species, and what is worse, do not care to learn or know anything about them." The preceding statement about the indifference of school children in regard to birds is as true today as when it was written. One does not need to spend much time afield before discovering the fact that the only interest most boys have in birds is that of shooting them. During the last three years I tramped several thousand miles through the woods and fields, usually in company with a few boy scouts. The only boys I found during that time that had other interests in birds were boy scouts or an occasional boy that had been reached through the schools.

NEST AND EGGS OF BOB WHITE

Children who know birds and their habits do not destroy nests or eggs.

During the three years, I found many nests that had been robbed and destroyed and many birds that had been shot. Flickers, red-headed woodpeckers, robins, phoebes, blue jays, warblers, red-winged blackbirds and other birds were found dead. I was told by one man that blue jays were all bad birds and should all be killed, that red-headed woodpeckers drill holes in the cornices of houses and should as a consequence be shot. "I hate them," one man told me. These men as boys no doubt spent much of their time when in the woods shooting birds. And how people run for their guns if a hawk or an owl is observed in the top of a tree in the distance! One would almost suspect that these birds swoop down and carry off children the way they are persecuted. As a matter of fact hawks and owls spend most of their time hunting and destroying mice.

The boys guilty of shooting innocent and useful song birds, however, are not to blame for not knowing better and not having other interests in birds. They have not been taught otherwise nor given other interests in them. And when these boys become men they still will have no other interests unless in the meantime they come in contact with some person able to change their interests.

Boys and girls are easily interested in birds if they have a leader. Any person willing to spend a few days in the fields and woods with some of them can easily prove the truth of this assertion for himself. However, it also remains a fact that at present the main part of this interest in birds must be aroused in our schools, though the boy scout organization is doing considerable, not nearly as much as it might do were more scout leaders interested in the subject. More children, too, for that matter, should be reached through the home. In school, the interest of the teacher is necessary; in the home, the interest of the parents is necessary; and in the scout organization, the interest of the leaders is necessary. But assuming that in the school the teacher is interested, how may she interest her pupils in birds?

Perhaps the easiest, and at that a good starting point, is to get the pupils to tell what birds they know and what they know about them. A discarded nest, a few attractive bird pictures, a stuffed specimen, or a bird seen from the room may serve as a starting point and as illustrative material for stimulating interest in these conversational exercises. The conversational exercises may be followed by bird stories. There are a number of books containing interesting bird stories as well as many papers and magazines that contain such stories from time to time.

Pictures should be used freely for the purpose of adding interest and as a help in identifying birds. Pictures of birds which are then to be seen should be shown to the pupils and the pupils

encouraged to go to the woods and fields for the purpose of seeing the actual birds. For example, suppose the chewink, bobolink, or brown thrasher is then to be observed. Show pictures of the bird to the pupils. Tell them that the bird is then to be seen in a certain place. Encourage them to go and see the bird for themselves. Stories about birds which are then to be seen also add interest and stimulate the children to go and look for them.

Bird study and bird house building contests may be used to advantage. The writer conducted a bird study contest two years ago in which more than two hundred pupils in a ward school took part. The pupils were given a list of common birds for study. They were asked to learn all they could about the birds listed. They might study bird books, tramp through the woods observing them, learn all they could about them from pictures, stuffed specimens, teachers, parents, or any other sources. At the end of a stated time they were given a set of questions and exercises on the birds. Prizes were awarded to the pupils writing the best papers. A year ago a bird house contest was conducted. Both contests proved successful and tended to interest many children in birds that up to that time had been indifferent to them. Naturally, excellent prizes for such contests are bird guides and bird books. Interested parties may sometimes be induced to donate the prizes. Otherwise funds for the purpose may be secured by giving programs or socials.

WRENS WANTED

Bird building contests are an incentive to acquiring a knowledge of birds.

A bird calendar may be kept giving the names of the birds observed, when each was seen, where seen, size, colors, and other observations as well as the name or names of the pupil or pupils reporting them. In connection with the calendar, teach the pupils a few important points in regard to observing birds. That when they are out in the fields or woods they should either sit or stand entirely still or move very slowly and quietly. The boy or girl who goes to the fields and woods and sits still while there will see and learn more than the one that runs about here and there frightening the birds away. Teach them the art of "Waiting in the Wilderness" at which Enos Mills was a master. Give them Dallas Lore Sharp's prescription for "Wood Medicine" and if possible induce them to take it in liberal doses. That means that they are to go to the woods and fields often and there sit still for one hour at a time and to refrain from talking. Have them note the size of the bird by comparing it as to size with the robin and English sparrow and also have them look for distinguishing marks. They should also take note of what the bird is doing and its song and call notes. Children sometimes interpret the notes of birds in striking phrases. For example, a boy told me that the red-winged blackbird's song sounded like "Straw-ber-ries," another interpreted the cowbird's notes as "Police," and still another the blue jay's "ge-rul-lup" as "de-vel-op." The teacher in order to conduct a calendar or for that matter any exercise on birds successfully must spend considerable time afield, must know what birds are to be observed and likely to be reported, and should question the pupils carefully on each bird reported to make sure that it was actually seen and correctly identified. The teacher too, must take "Wood Medicine" in liberal doses. Encourage the pupils to set out a pan of mud for the robins when building their nests and pieces of yarn and thread for the orioles. Get them to set out a pan of water or to make some other kind of a bird bath. Bird baths may be easily and quickly made by scooping out a hole in the ground and then taking three parts of gravel and one of cement and making a concrete bird bath. Birds need water both for drinking and bathing purposes and will go long distances to get it. It is as a consequence easy to attract them to the yard by means of a bird bath. There they may be observed and studied to splendid advantage. Encourage the pupils to feed the birds, to put out suet and crumbs for them and perhaps make a few simple feeding devices. Have them set out bird houses and to report on their feathered tenants. Remember that the boy or girl that feeds and waters the birds and enjoys watching them is pretty sure to be a bird protector and not

THREE LITTLE RING BIRDS

Baby birds have a particular appeal to pupil and to teacher.

a bird enemy. Collections of nests may be made during the fall months and a study made of them later on. "Nothing in all ornithology," writes C. F. Hodge, "is better fitted to inspire in a child the love of bird life than the study of their wonderful nests. If the children were given a course in such study during February or March, they could hardly be induced to molest a bird's nest the following season." Stuffed specimens and slides if procurable may be used and trips taken to a museum if there is one near by.

One of the most important of all ways of interesting children in our feathered friends is to take them on bird study hikes or field trips. Small groups are better than large groups. There will then be less noise and consequently more birds seen. Go often and take a few children at a time. Better to take them on a few ideal trips than on a dozen noisy boisterous expeditions.

Natural Science and Nature Study in the Schools

THE FOLLOWING is the course of nature study advised by the Department of Applied Education of the General Federation of Women's Clubs, for Grade Four.

It can readily be adopted by a mother as a course in nature study for her children, or can be made the basis for study by any lover of nature.

GRADE FOUR

Gardens:

Cover strawberry bed; prune currants.

Transplant iris, hollyhock, larkspur and phlox to their permanent positions.

Take up and care for caladiums and cannas.

Plant green fertilizer like red clover, soy beans or vetch on one-half of plot to be used as an experimental plot next spring.

Garden work has thus far been community work—let it from now on be individual except in the school garden which will serve as a demonstration plot. The pupils' gardens will be home gardens.

Each pupil will plant daffodils in pots and trench them and rear them at home. He will grow paper-white narcissus and pot marigold at home also for the flower show. Grow jonquils in the school window boxes.

Plan individual gardens on home plots and have pupils grow a succession of crops to get maximum returns from a small plot of ground.

Toys and Home Appliances:

Let children make and use giant stride to get acquainted with centrifugal force. Whirl a pail with some water in it about your head; why does the water not fall out when the pail is upside down? Make a sling shot like David used with which to kill Goliath.

Spin Tops.—While spinning the tops on your hand, incline the hand; why does top remain erect? Let a spinning top slide down a string held tight from one end to the other.

Make gas with coal packed in the bowl of a clay pipe. Close the mouth with clay and heat the bowl. Will the gas burn? How is a house piped for gas? Make chlorine gas as a school room demonstration. Heat baking powder in a test tube with a delivery tube through the cork to get off the CO_2 gas. (Why bread rises.)

Make and explode gunpowder.

Make fire as the Indians did with a "bow stick." Make fire with flint and steel. How a match starts a fire. Make oxygen gas and show how readily a glowing stick bursts into flame in it; how iron wire burns in it. How to make a fire in the woods to heat a pail of water quickly; to make one that will last all night; one that will throw its heat into the tent.

Pets and Domestic Animals:

Aquarium Studies.—Make aquaria; stock them with pond plants, small fish, insect larvae, etc. Learn to recognize the common kinds. Myriophyllum or milfoil, potamogeton or pond weed, bladderwort; limnaea, planorbis and other snails; nymphs of the May fly, damsel fly, dragonfly; giant water bug, water scavenger beetle, the water skater, whirligig beetle, water scorpion, etc.

Aquarium Studies.—Continue the aquarium in the school. Study the behavior of the crayfish and other crustacea such as the fairy shrimp, the bender, Asellus, cyclops, etc.

Frogs and Toads.—Development of the eggs. Watch the development of the eggs to the tadpole and the change of the tadpole to the adult. Learn to recognize the common frogs, bull frog, leopard frog, pickerel frog, tree frogs, etc. Provide attractive retreats for toads in the garden, holes covered with boards and nearby pans of water and learn why toads are valuable in a garden.

Correlated Materials:

Collection of fall insects, butterflies, moths, beetles, locusts, wasps, bees, dragonflies, housefly, mosquito, and ants.

Protective coloration.

Beneficial and injurious insects.

Study of Mold.—Experiments to show spore carriage and sterilization.

Edible mushrooms. Ferns and other spore bearers.

Map off some block or of a wood patch to know its trees. Know the common trees: Ailanthus, ash—red black, blue, white-balsam, birch, catalpa, black and choke cherries, dogwood, red and white elms, black gum, hackberry, hawthorn, hemlock, larch, black and honey locust, ash leaved, Norway, red, rock and soft maples, mulberry, black, bur, pin, red, scarlet, white oaks, paw paw, pepperidge, pine, aspen, balsam, cottonwood, Lombardy, and silver poplars, redbud, sassafras, spruce, tulip tree.

Good shade trees and ornamental shrubs. Planting home grounds.

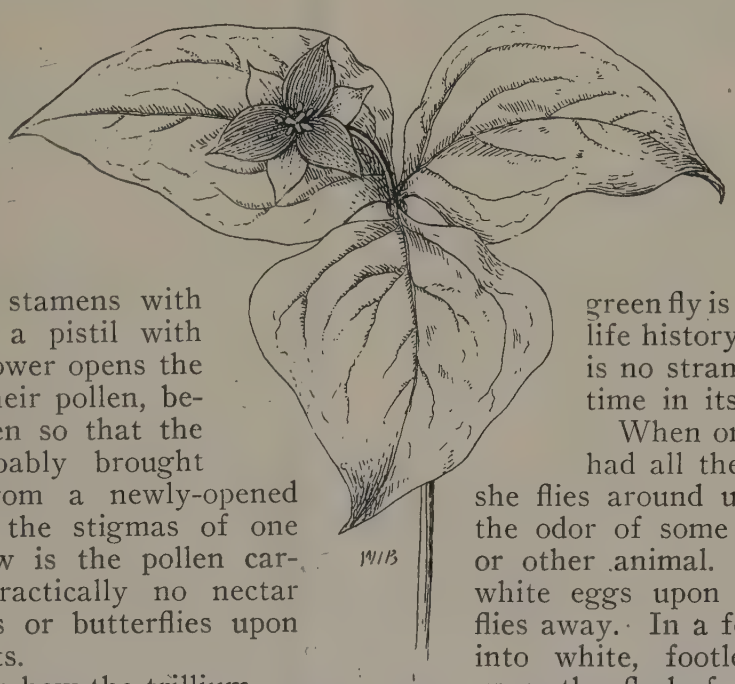
The Trillium and the Fly

By CLARENCE M. WEED
State Normal School, Lowell, Mass.

MOST fragrant flowers have odors that are distinctly pleasing to our sense of smell. Such blossoms add greatly to our enjoyment of the plant world. They are generally visited by bees and butterflies, for these insects seem to be pleased with the same sorts of odors that are pleasing to the members of the human race.

Some flowers, however, are distinctly unpleasant to our sense of smell. They have odors that repel rather than attract us, and they seem also to repel most of the bees and butterflies. The purple trillium or ill-smelling wakerobin is a good example of such a plant. It is common over a wide range in the northern states.

The flower of the purple trillium consists of three green sepals, three purple petals, six stamens with dull yellow pollen, and a pistil with three stigmas. As the flower opens the stamens begin to shed their pollen, before the stigmas are open so that the cross-pollination is probably brought about by the pollen from a newly-opened flower being carried to the stigmas of one longer opened. But how is the pollen carried? One can find practically no nectar and one never sees bees or butterflies upon the blossoms of the plants.



THE PURPLE TRILLIUM

Why the flesh flies visit this ill-smelling trillium or wakerobin blossom.

The surest way to learn how the trillium pollen is carried from one flower to another is to sit down among the blossoms and remain quietly watching them for some time. Before long you are likely to see some two-winged flies light upon the petals and nibble at the pollen. They crawl over most parts of the flower before they leave and get more or less pollen upon their legs and bodies. Then they fly away and soon settle down upon another flower. They crawl over this in turn and are likely to leave many pollen grains upon the open stigmas. Thus in return for a little pollen they serve the plant very effectively in the matter of reproduction.

How does it happen that these two-winged flies are attracted to the trilliums while the bees and butterflies are not? The fact that there is little or no nectar is, of course, enough to account for the absence of the butterflies. The bees, however, do not seem to come for pollen as they do to many blossoms that have no nectar.

We have learned that most bees feed in their larval stage upon nectar and pollen, and I suspect they are so used to the sweet fragrance of this combination, that they continue to be attracted by it when they become fully developed adults.

The flies that visit the trilliums have a life-story very different from that of the bees. They are mostly the so-called flesh flies, of which the common green fly is a familiar example. The life history of this fly shows that it is no stranger to foul odors at any time in its changing existence.

When one of these flesh-flies has had all the pollen she cares to eat she flies around until she is attracted by the odor of some dead caterpillar, mouse or other animal. She lays some slender white eggs upon the decaying flesh and flies away. In a few hours the eggs hatch into white, footless maggots that feed upon the flesh for several days—perhaps a week. They then become full grown as larvae, and their outer skin hardens to form a sort of cocoon-covering or pupa case. They are then brown in color and oval in form. Within these pupa cases the larvae change to pupae, to change again a few days later into fully developed flies such as the one by which the eggs were laid.

Thus these insects are in the midst of foul odors throughout most of their lives, and it is not strange that they are attracted by the familiar smell of the trillium blossoms. How fortunate it is for us, however, that most flowers have been adapted to the pleasanter tastes of the bees and butterflies!

NATURE NEWS AND VIEWS

Trees on the Prairies

Why the prairies have been treeless is not fully understood, but the labors and experiments of many years have shown that trees can be made to grow in the prairie region if a few simple precautions are taken. The value of trees upon prairie farms is threefold: They give protection from drying winds, thus adding to the productivity of the soil; they provide wood material for many uses, and, above all, they relieve the monotony and add to the comfort and content of life. It is now estimated that trees planted in prairie sections of western Canada may be valued at twelve million dollars.

Making Milk from Sawdust

Most folks might think sawdust proper food only for the little wooden cows in baby's toy Noah's Ark, but the United States Forest Products Laboratory at Madison, Wis., finds that really high-producing dairy cows give just as much milk when hydrolized sawdust forms a third of the feed mixture. This is one of numerous scientific developments brought about through the agency of the Government Experiment Station, the aim of which is to avoid wastage in the production of forest products.

Nature Makes Good Citizens

Mr. R. S. Kellogg, secretary of the Newsprint Service and chairman of the National Forestry Program Committee, in a recent speech, said that the boy who learns Nature's laws and acts in accordance therewith generally "makes good." In declaring that there was no easy road to success in forestry, he went on to say that evolution teaches that progress is gradual, that sudden radical changes are not to be expected, because the future has its roots in the present. The forester is fortunate in his understanding contacts with nature.

The American Lumber Industry

Once more emphasis is placed on the depletion of our forest resources and the need of immediate steps to recreate them in the interest of the future livelihood of the five million people directly dependent upon the lumbering and wood-using industries of the United States. This time the warning comes from Nelson Courtlandt Brown, professor of forest utilization at the New York State College of Forestry, in a new volume, "The American Lumber Industry," published by John Wiley and Sons, Inc., New York.

The book is designed to fill the need for a comprehensive textbook on this vital industry. It is aimed to reach forestry schools, those engaged in the lumber industry, and all seeking information on the national phases of the industry. It is the result of long study and careful collection of facts, and it admirably achieves its aims as both a practical and informational volume of high value.

Conservation Week

Conservation Week will be observed under the auspices of the Federated Women's Clubs of the state of New York, April 1 to 5. Last year the State Board of Education gave permission for the placing of speakers in the public schools, and this plan will be repeated during 1924. The Conservation Committee of the New York Federation of Women's Clubs, under the very able direction of Mrs. Charles Cyrus Marshall, is offering prizes for original compositions by school children, dealing with forestry, wild life, national, state and local parks, water power, drinking water, and similar subjects. Conservation Week is well established as an important annual event in New York State, and the plan is being adopted elsewhere throughout the country.

The most beautiful feature of the entire undertaking is the discovery that men, women and children will work together, in time of peace as well as war, for a movement that has for its object the welfare of our country. There seems to be an intense desire to redeem the past with its wanton cruelty and wastefulness and, by united effort, to save what is left of our natural resources.

A Letter from the President

THE WHITE HOUSE, WASHINGTON
January 7, 1924.

MY DEAR MRS. MARSHALL:

You have done me a service by informing me so fully of the program of the New York City Federation of Women's Clubs for its observance of Conservation Week this spring. I am so glad to know you are succeeding in carrying this excellent service into the public schools, for there, of course, it will be particularly productive of permanent results. The nation, and indeed the world, have need of a thorough appraisal and understanding of the natural resources, both in wild life and in the riches of the earth, and in directing thoughtful consideration to this whole broad subject you are doing a work which is deserving of every encouragement.

Most sincerely yours,
CALVIN COOLIDGE.

Mrs. Charles Cyrus Marshall, New York City Federation of Women's Clubs, 2239 Tiebout Avenue, New York City.

A Bird Prophet

In olden times it was a common superstition in northern Europe that the appearance of the "Silky-tail" foreboded war, pestilence, famine, or some dire natural catastrophe. The bird, a larger relative of our familiar cedar waxwing, came later to be known as the Bohemian waxwing, but whether in allusion to its wandering habits, or to its occurrence in Bohemia, is not known. It was found to be also an inhabitant of America where it has been seen as far south as Pennsylvania in the east, and Arizona in the west. Here it is usually a rare bird, but, as in Europe, it is an erratic wanderer, and sometimes appears suddenly in large flocks. The dread which it excited in the old world seems never to have gained a foothold in America, where, indeed, it has remained unknown to most of our people.

A Real Accomplishment

At the seventeenth annual meeting of the American Bison Society, it was reported that there were on January 1, 1923, 3,654 buffalo in the United States, consisting of 147 herds. Only eight states in the Union are without buffalo, either in a semi-wild state or in zoological parks. These states are Maine, Vermont, Rhode Island, Connecticut, Virginia, West Virginia, South Carolina and Florida. It is interesting to compare these figures with the census taken in 1908 by Dr. William T. Hornaday and printed in the first annual report of the American Bison Society. At that time there were but twenty-four states in which buffalo were found, the total number of animals being 1,116. Here is a concrete result of a well-conducted conservation movement! The American Bison Society is also taking an active part in the movement to preserve the American antelope.

Our "Garden Full" Collections

A Garden Full of Gladioli for $2.00

The Gladiolus is one of the most satisfactory flowers grown and there is no reason why every family cannot enjoy this grand flower—it is as easy to grow as the potato.

Bloom from July to frost if you plant a few bulbs each month from April to July.

For TWO DOLLARS we will send 50 Bulbs of our Grand Prize Mixture, which covers every conceivable shade in the Gladiolus kingdom.

Each year we sell thousands of these bulbs and have received numerous testimonials as to their merits.

Simple cultural directions in package.

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Mail your order with Check, Money Order, Cash or Stamps and collection will be sent prepaid to your home.

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New and Rare Exhibition Dahlias

Few flowers, whether used for garden decoration or principally for cut blooms to decorate the home, are as responsive to simple garden culture as our Modern Dahlia. It has made wonderful advancement in size of bloom, habit of growth and profuse blooming qualities.

In order to further its now great popularity, we are offering this collection of

12 Dahlia Tubers for $3.50

—one each of 12 distinct varieties, not labelled, which if purchased separately according to name would cost not less than $10.00.

Order Your Tubers Now so as to have them ready to plant any time after the tenth of May or when all danger of frost is past.

Mail your order with Check, Money Order, Cash or Stamps and collection will be sent prepaid to your home.

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[ANNUAL FLOWERS]

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A popular assortment of twelve easily grown Annual Flowers in the most striking shades and colors. They all flower within a short while after sowing seed and will furnish an abundance of flowers until frost. This collection, if purchased separately from our catalogue, would cost $1.55.

One Packet Each of the Following for $1.00

Alyssum — *Little Gem, White*
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Mignonette — *Allens Defiance*
Nasturtium — *Giant Dwarf Mixed*
Phlox Drummondi — *Finest Tall Mixed*
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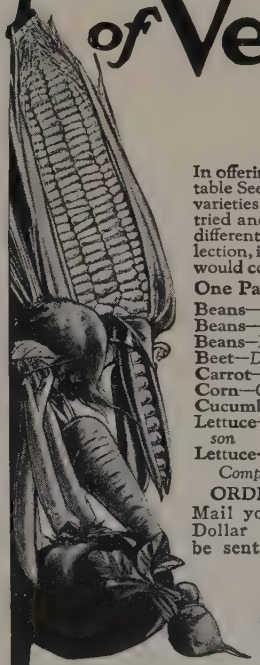

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Beans—*Bountiful*
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Cucumber—*White Spine*
Lettuce—*Black Seeded Simpson*
Lettuce—*May King*
Onion—*White Portugal*
Parsley—*Curled*
Peas—*Little Gem*
Radish—*Scarlet Globe*
Radish—*White Icicle*
Spinach—*New Zealand*
Swiss Chard—*Giant Lucullus*
Tomato—*Selected Stone*
Turnip—*White Globe*

Complete cultural directions with each collection.

ORDER YOUR COLLECTION NOW

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Our 1924 Spring Seed Annual sent on request.

SPECIAL COLLECTION OFFER—One each of the above collections (four collections in all), which if purchased separately would cost $7.50, sent prepaid to your home for **$6.00.**

Saving Montana Birds

Montana State College at Bozeman, Mont., is planning to capture half a dozen birds each of blue grouse, prairie chicken, and other native grouse, and each other Montana game birds as may be available. Then the Poultry Department will carry on experiments to determine in what manner these birds can be raised so as to assure a continuance of their existence in the state.

Maintaining the Balance

The editor of Nature Magazine recently received a letter criticizing the movement for the protection of the American eagle on the ground that eagles kill other game. Mr. William L. Finley, our Western Field Representative, answers that in this great outdoor world of ours the eagle has a place in the balance of nature. He who reaches the conclusion that all eagles should be killed because they have been caught usurping the exclusive right of man to kill game has perhaps failed to realize that, in addition to the eagles, we have some forty varieties of hawks and thirty-one species of owls in this country. It is likely that at times most of these seventy-two species of birds of prey might be caught killing a game bird. Should they, therefore, be exterminated, as well as the eagle? It is true that jays, crows, shrikes and other species of birds, as well as certain varieties of snakes, have preyed on game. In fact, there are so many creatures that prey on game that the question arises as to just where a war of extermination should stop.

This world of nature in which we live is a great and complicated system, and there is a good deal of wisdom behind all of it which the finite mind of man has not yet fathomed. When we begin a campaign of extermination just where is it going to end?

Committee to Select Park

Congressman Henry W. Temple, of Washington, Pennsylvania, and Major W. A. Welch, general manager of the Palisades Interstate Park, of New York and New Jersey, have accepted invitations from the Secretary of the Interior to serve on the committee to select the site for a national park in the Southern Appalachians. Two additional members will be selected by the Council on National Parks, Forests and Wild Life of New York City, and Colonel Glenn S. Smith, topographic engineer of the Geological Survey, will represent the department on the committee.

New Forestry Association Head

George D. Pratt, of New York, has been elected president of the American Forestry Association to succeed Col. Henry S. Graves, provost of Yale University, whose additional duties forced him to relinquish the office. Mr. Pratt is a former Commissioner of Conservation of New York State and has long been active in conservation circles, serving as treasurer of the Boy Scouts of America and for many years as president of the Camp Fire Clubs of America.

Cattle

(Continued from page 219)

drives, range wars and other epic doings of the old-time west. It was principally upon the open range that the cowboy evolved the fundamental principles that underlay and shaped the civilization and spirit of the west. It was principally upon the open range that the cowboy did the things which the "movies" and fictionists have misunderstood, exaggerated and misprized, which have led such of us as rode with the cowboy to extend to him endless admiration, tenderest affection, and unquenchable respect. Some of the huge, privately-owned ranch lands in Texas offered a stage for like happenings and developments; but these ranch lands, extensive as they were, were dwarfed by comparison with the open range.

While the range wars, beloved by producers of motion pictures and by writers of western fiction, were far fewer and much less bloody than the screen and the short stories have insisted, they, nevertheless, did occur from time to time. They represented here "arguments" between cattle thieves and cattle owners. They represented there attempts by cattle owners already upon a range either to rid it of such homesteaders or sheep as had wandered on to it, or else to drive from it whatever excess cattle recently had been brought upon it by rivals and in violation of the west's unwritten code against overstocking a locality.

Homesteaders or "nesters," whichever one cares to term them, were a hated enemy of the western cattle man; for, although human beings, actual or prospective citizens, and usually decent people, they meant wire fence. And wire fence meant the throttling of the open range.

Sheep were also a hated enemy of the western cattle man; for, although sheep and eastern cows have ever been able peacefully to graze within the fences of a single field, the half-wild western cattle and horses always refused to stay in the same locality with any bleating, ill-smelling, woolly flock. Sheep, with their thin lips, nibbled the range grass to its roots; with sharp hoofs, chopped those roots into dust; with their constant travel necessary for the avoidance of disease within large flocks, their so-called "walk," carried their destruction mile after mile; and, with their pungency, either left a scent upon the ground or imparted to a water hole a lingering taste and smell. They found a grass land, and they left a desert. One sniff of the odor that floated from wool, and a band of cattle would break into wild stampede.

The ranchmen of the open range, although squatters on the land, were for a term of years of economic value to the public. They converted otherwise unused grasses into edible flesh during the time in which the west was awaiting the arrival of the farmer who would make intensive settlement and employ methods less hazardous and more efficient than those which the ranchmen used.

The ranchmen's methods were relatively inefficient, not only because of lack of careful oversight over more than a fraction of the cattle but also because of inability, through paucity of laborers, to extract from the land its maximum quantity of fodder. Under the grazing system of the open range, each animal, for its sustenance, required, in the average locality, the use of approximately eleven acres of land. A farmer, by irrigating those acres and by growing upon them alfalfa or other hay, might thereby garner provender sufficient to feed from ten to forty cattle throughout a year.

The ranchmen's methods disclosed, as another phase of inefficiency, amateurish business instincts which led people in many instances to financial disaster. This was no phase of which the nation need be ashamed. Merely a host of young men, trustful and trusting, skilled in adventure but untrained in the counting room, idealistic but impractical and improvident, essayed the management of a huge industry. They raised live stock and led a life that stirred the imagination, but they did not know the difference between capital and income. The cattle which they sold represented always, so they thought, interest on investment, whereas oftentimes the beasts thus parted with were a portion of the capital. No allowances were made for amortization or for capital losses caused by drought, disease or storm. Inconsequential lads kept their eyes upon prodding cattle and bucking broncos, rather than upon prosaic ledgers.

"Never censorious progress can banish
Dreams of the glorious youth that we had!"

To the refrigerating car and to the businesslike management of the packers, the American public is indebted for the cattle and cattle products that emerged from the western ranches. Although cattle could be

driven unconscionable distances to attain desirable feeding grounds, they could not profitably go far upon the hoof when headed for the butcher. Their profits lay in their fat, and to turn this into sweat was bad business.

But for the refrigerating car, dressed beef would have been incapable of shipment, and each city and town of size throughout the United States would have been dependent upon locally slaughtered animals. But for the packers, there would have been no standardization in meats, no such grading up as occurred among the live stock, no such excellence in the quality of the output of cattle products as now obtains.

Gradually the lands of the open range passed piecemeal, partly into private ownership, partly under private control. The lands that passed under private control remained, for but a short period, in that status; and then were subdivided into private ownerships.

With private ownership came small pastures, and also wire fences that girded all the land and water of which the owner had possession; fences which ultimately grew so numerous as to leave only here and there patches of open range.

Private control was attained by reducing to private ownership the entire water supply upon which great unowned stretches of adjacent and otherwise waterless lands were dependent. In this way, a person, if in a semiarid country, might automatically enjoy the exclusive usage of mile after mile of herbage to which he had no title. But presently most of these lands surrendered, in part to the dry farmer, in part to the farmer with irrigating ditches that brought water from afar. These farmers, too, erected fences.

And thus all but a mere fraction of the once vast open range has now ceased to exist, save in history and in the affectionate memory of the still living men who long ago punched cattle amid its boundless acres. The part that does exist is represented by tracts scattered here and there in various western states and as yet unrestrictedly "open," is represented also by the national forest areas in which such cattle owners as are licensed by the Federal Government to do so, may graze their animals. However, the cattle within these forest areas are relatively few: two million out of the nation's aggregate of sixty-seven and one quarter million beasts.

The farmer and his fences have ended the erstwhile glamour of the west. Gone forever are the wide flinging round-up of cattle and of horses, the cattle drive, the stampede, and the winter "drift" by live stock. Gone forever is the lone rider miles from any habitation and fighting, in solitary helplessness, thirst, hunger, Indians or quicksand. The pony express and the vigilance committee, too, have gone.

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Do you know the many beautiful colors and shapes obtainable in Evergreens? We will send you free for the asking, copy of Hill's 1924 De Luxe Evergreen Catalog. This shows 23 full page color pictures of Evergreens. You will greatly enjoy reading the 84 pages, with over 100 illustrations.
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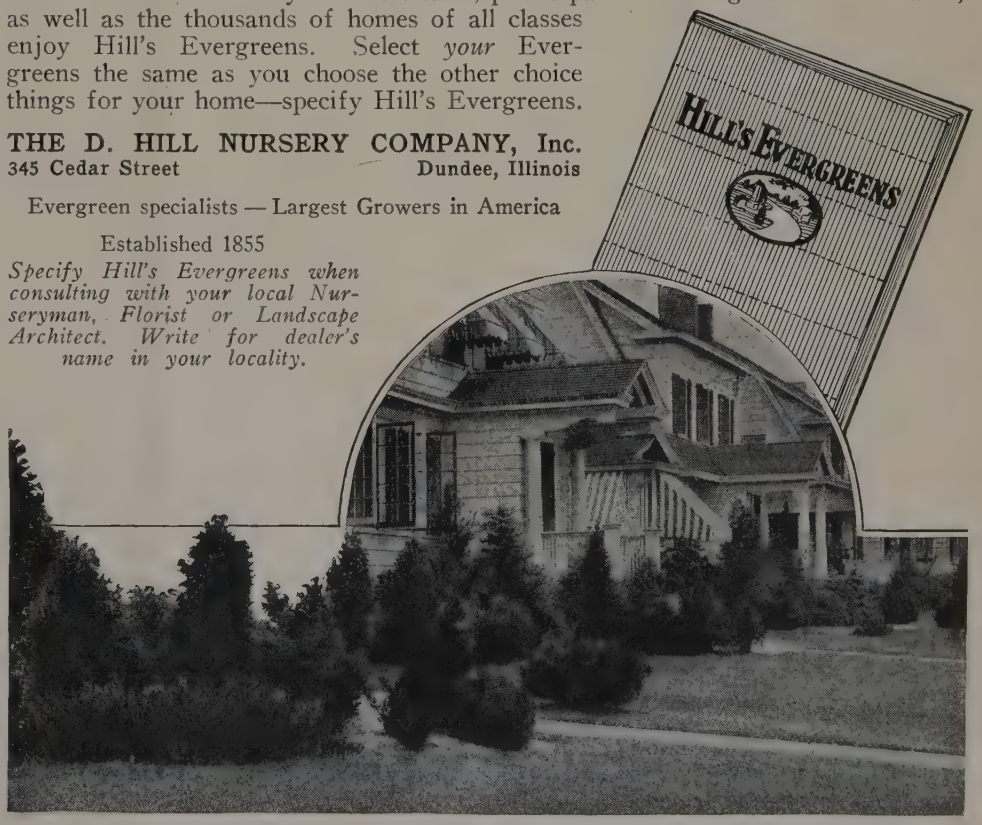

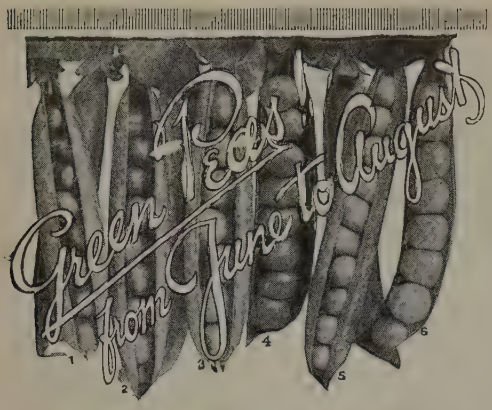

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Remember—*Peas must be planted early*—Late planted peas are always a disappointment because they need the cool, wet weather of Spring to give them a good start.

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½ lb. each of all 6 varieties, 3 lbs. in all..... **$1.75**

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Ford cars, the Victrola and the radio have come to take their place.

The farmer, with his perhaps prosaic but assuredly painstaking methods, has ruthlessly absorbed and subdivided almost all of the great ranches of former generations.

The cattle no longer appear in tremendous herds to form, with their readily unleashed savagery, the virile elements in a melodramatic picture. They have been driven behind wire fences, and there, principally in little pastures, they complacently chew their cuds. So complete has been the change that the United States Government, in its printed census reports for the year 1920, has wholly omitted the words "ranch" and "ranchmen" and has spoken everywhere only of farmers and of farms. The cattle king who years ago started northward, up the Chisholm Trail, herds each of three thousand animals, and who was acclaimed throughout the west as a prince despite America's democracy, where is he? Passed, with pitifully few exceptions, into history. Where are the cowboys who once dominated the west? They, too, have ridden into history, save that there still remain, in little corners of the west, scant tracts as yet uncorseted by the farmers' fences. From these tracts there periodically ride forth, in jaunty picturesqueness, cowboys who are replicas of the early pioneers, and in many cases their blood descendants—ride forth, not to guide herds from the Rio Grande to the Canadian border but merely to take an honest part in current Wild West shows.

In place of the great live stock ownerships common in a generation now bygone, the average modern farmer owns, if in Texas, but fourteen and one-tenth cattle; if in Montana, but twenty-two such animals; and, if in Wyoming, but fifty-five and six-tenths of them. And do you ask fifty-five and six-tenths of what? Of cattle, which the present writer, years since, saw, in terms of thousands, winding their way in serpentine course along fenceless, endless miles, and straining the ire of leather-clad men who were sitting astride of impish broncos.

But the modern farmer, despite the accusation of commonplaceness, has, since he assumed virtually exclusive management of live-stock raising, both increased the aggregate number of America's cattle and also bettered their quality. The nation's cattle, notwithstanding occasional setbacks caused by war, drought, or economic conditions, have more or less steadily shown increment in number. The aggregate number of the nation's beasts in 1924 is one and one-quarter times what it was in the year 1890, one and two-thirds times what it was in the year 1880, and two and two-thirds times what it was in the years 1870 and 1860. Although the thus multiplying cattle have increased in number in every eastern section save New England, the marked expansion has been in

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should be in every home that has a garden. It is a veritable mine of information on the growing of Vegetables and Flowers, and articles by leading authorities are of absorbing interest as well as practical value.

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This new Yew has been growing in our nurseries for several years, but not in sufficient quantity to introduce to the trade until this year.

One of the Finest Upright Evergreens

ever presented to American gardens. Prof. L. H. Bailey, in his new book "Cultivated Evergreens," says it is perfectly hardy at Arnold Arboretum. *Taxus cuspidata Hicksii* was named by E. H. Wilson and described in the Bulletin of Arnold Arboretum.

1 to 1½ ft. Plants
$5 each, B. and B.

Juniperus Meyeri

From China. Shows varying colors according to lighting—green, blue, tinges of red. A remarkable new evergreen.

Home Landscapes, our new catalogue, sent on request.

Hicks Nurseries
Box N, Westbury, L. I., New York

the western states. While but 36 per cent of all the nation's cattle lived west of the Mississippi River in the year 1860, 61 per cent are there in this present year of 1924.

Dairying has annually increased its relative importance. Of all the cattle in the United States today, 48 per cent are reserved for dairy purposes. The cattle now east of the Mississippi River are primarily dairy animals, while those west of it are, in the main, destined for the abattoir and beef. The states east of the river, though sheltering but 39 per cent of the nation's cattle, have 58 per cent of all its dairy beasts. But as regards beef, the states west of the river hold 75 per cent of all the nation's beef animals.

America's citizens have recently increased in number far more rapidly than have America's cattle. Wherefore, theoretically, the farmer of today should have no difficulty in making profitable disposition of his animals and their products. Theoretically, there should be such demand for his output as to leave him worryless. But such is not the case.

In bygone years, conditions were automatically selfadjusting. Ranchmen, when raising an excess supply of beef, found relief in large exports to Great Britain. The public, in the event of an occasional shortage in beef, could obtain remedy through meat or animals imported from the Argentine or through animals brought from Mexico. Incidentally, some of these Mexican animals arrived as "wet" cattle; which is to say, they swam across the Rio Grande River, this not uncommonly at night; and, upon arrival, they were not bothered with any questions as to their origin, or even as to whether or not they had been stolen.

At the present time, conditions are out of gear. Whether, as regards the westerner, it be owing to the droughts which, in successive years, occurred in many portions of the west; whether, as regards the farmer everywhere, it be due to the high cost that labor now exacts, or whatever be the cause, the American farmer of today is face to face with a very onerous situation. At present market prices, his milk is profitless, and his cattle, if sold, will not, in the main, yield money sufficient to pay the amount of the mortgage owed upon the beasts thus sold.

In past years it was customary to deal with the farmer as a prospective voter at a prospective election, to treat him as a political pawn. The gravity of his present position has taken him far beyond the status of a mere prospective voter, and he and his difficulties have become an economic problem of vital importance to the entire American nation. A solving of the enigma that besets the farmer is perhaps the most important duty which confronts America today.

The Little House Next Door

(Continued from page 212)

lock, Japanese holly and boxwood.

In one short article it is impossible to mention more than a small proportion of the endless variety of trees and shrubs. Similarly, one cannot give a set of definite recommendations for planting, because of the varying climates and conditions which prevail in different sections of our country. Many plants that succeed in the east will not thrive in the dry central plains without irrigation or constant attention. California is indeed blessed with a climate favorable to numberless forms of plant life, but elsewhere the choice becomes more limited. However, local advice can nearly always be had without charge. Most nurseries maintain a service of this kind, while the simple process of observation will often indicate a large variety of plants thriving in adjacent woods or fields, or upon some other property within one's own community.

The owner of the new little house set about his task in the right way. This very summer the bare and bleak newness will have been somewhat toned by Nature growing in profusion 'round about. The owner may not have the time or the means to at once transform his dwelling into the counterpart of its original, but time will work in his favor, and by the time the new baby in our house is able to walk as far as the other end of town she, too, will look up at

$12.00 For This Beautiful *Stone Bird Bath*

Delivered freight charges paid to any point East of the Rocky Mountains. The only Bird Bath on the market for a price anywhere near so low. Stone, fashioned in curving, graceful beauty of classic simplicity. The Bowl is 21 in. in diameter. The Pedestal is 26 in. high, 12 in. in diameter at base. This beautiful ornament will fill your yard with songsters. Write us if you do not have a distributor in your city and we will supply you.

Bid Jenny Wren Welcome

$1.00 postpaid for this beautiful Wren House, stained brown, set up complete ready for use, bottom hinged for cleaning.

4 for $3.00

EZY CLEAN Martin House

$9.50 Two story, 20 compartment, 22 x 22 x 21 inches.

Three story, 28 compartment, 22 x 27 x 21 inches, as shown..... **$11.50**

Take out four bolts, one on each corner, and every compartment is accessible for cleaning—can be cleaned in ten minutes.

Made of clear lumber, set up complete, ready for paint, freight charges paid to any point East of the Rocky Mountains. Well designed, well made, exceedingly attractive.

Lattice Stand for Martin House

The most attractive martin house stand on the market.

Fourteen inches square at top, twenty-four inches square at bottom, twelve feet high. Hinges at base to lower for cleaning. Foundation posts furnished. Beautiful substantial ornament, made of clear lumber, ready for paint. Freight charges prepaid East of Rocky Mountains.

Price..... **$16.00**

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Our line is handled by the highest class furniture dealers throughout the country. If your dealer cannot supply you, write us.

Beautifully illustrated Catalog on request to home owners.

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Kunderd *Gladioli*

Kunderd Gladioli lead the world in exquisite colorings and perfect form. So that you may know their beauty and enjoy them in your garden, I will send you my "Surprise" package prepaid for $1.10. Contains ten varieties—no two alike—but not labeled. If under names this collection would cost at least $3.00. Do not send stamps.

Send for my free catalog, illustrated in colors and giving my personal cultural directions, making it easy to grow gladioli. Write for a copy *now*.

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The Originator of The Ruffled and The Laciniated Gladioli

Strong-Rooted, 2- or 3-yr.-old Bushes: nearly 2 ft. high

To add quickly 1000 more customers we make this remarkable **SPECIAL OFFER** on the finest, fragrant varieties:

COLUMBIA—newest big pink; **GOLDEN OPHELIA**—rich yellow; **PREMIER**—rose pink; **DOUBLE WHITE KILLARNEY**—ivory white; **AMERICAN LEGION**—fragrant new deep red.

Every bush has already bloomed. Guaranteed to grow and bloom for you, or money back. Pick regular, long-stemmed, hot-house roses all summer and till frost comes.

ACT NOW Low price holds good only till limited number of collections is sold. Send $1.95 today—all five bushes mailed *postpaid* to your home when planting season opens. If beyond the Mississippi River, add 10c.

FREE *Collins 1924 Guide to Roses, Evergreens, Fruit, Grape Vines, Berry Plants, etc.; in colors.*

COLLINS NURSERIES

Est. 1860 Arthur J. Collins & Sons
Box 96 Moorestown, New Jersey

400 acres in nurseries and fruit trees

me and say, "Daddy, who owns the pretty little house over there?"

Camp Nature and Nature Camps

(Continued from page 226)

of course, form an important part. Physical well-being is a goal to be sought, and physical prowess develops traits of character of great value, providing it is not overdone. Among camp directors there is a variety of opinion concerning competition in athletics, many feeling that it tends to impress inferiority on those not able to be in the front rank. Among girls water sports, tennis and horse-back riding are favorites. Boys are likely to acclaim all the sports equally.

On the educational side many different avenues are open. In some girls' camps basketry and weaving are employed to develop the creative idea. With that fundamental of art—Nature—all around it is natural that such a tendency in a young camper should find expression, and many directors are seeking this out and encouraging it. Interest in and acquaintance with Nature can be fostered in many ways, much depending on the directors or the ones charged with this work. There is, however, a dearth of competent people who can impart Nature truths without "teaching" them.

For boys a wide range of activities are open. Mechanics, boat building and phases of the industrial arts are a part of the recreation in some camps. They give the boy opportunity to "find his bent" naturally. With the rapid rise of public sentiment behind the need of a thorough-going forest policy for the nation, forestry is rich in promise as a future camp activity. Already several boys' camps have it as an essential part of their work, teaching the boys practical work in nurseries, in woodlots and in forests; acquainting them with trees, their care and propagation. This is constructive camping of the finest sort.

To balance the activities in camp much wonderful work is being done by directors in developing the council hours, campfire talks and other ceremonies of camp life. These endeavors are to bring out spontaneously an appreciation of values on the part of the young people. Various systems of medals and honorable mention are used to develop initiative, ambition and achievement.

Indeed, the summer camp is virtually without limit to its possibilities in recreation and education. It is building self-reliant, alert-minded young people. It is a movement that needs the cooperation of parents in selecting the right camp for John or for Susan. It is a movement that is already receiving the support of thousands with vision to see what it can accomplish.

G & R Hardy Roses

On their own roots. Sure to bloom. True to name.

Rainbow Collection
5 Hardy Roses. Different Colors

Radiance—brilliant rosy carmine
Wht. Maman Cochet—creamy white
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All G & R roses are grown in large quantities, which enables us to sell them at moderate prices. Over four million roses sold by us last year.

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15 Gladioli—Cream of newer sorts, selected colors	$1.00
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4 Decorative Ferns—Assorted varieties	$1.00
6 Dahlias—embracing a splendid assortment of colors	$1.00
Special Offer—The 6 collections mailed postpaid for	$5.00

Complete catalog mailed on application.

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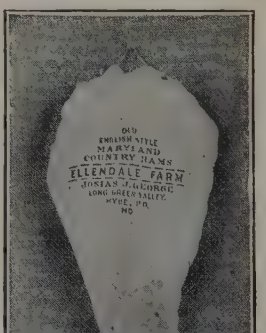
Largest Rose Growers in the World
Dept. 611 Springfield, Ohio



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Direct from Farm to Home

Cured January, 1923. Now one year old. Hams for family use. 7 to 10 pounds average, 40 cents a pound, express paid, east of Mississippi river.

Smoked with hickory wood, sewed in muslin. Delivered express paid.

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Ellendale Farm
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426 Rental Sets — 26000 Stock Slides
Special Slides made-to-order

Ask for supplement of 1924 releases
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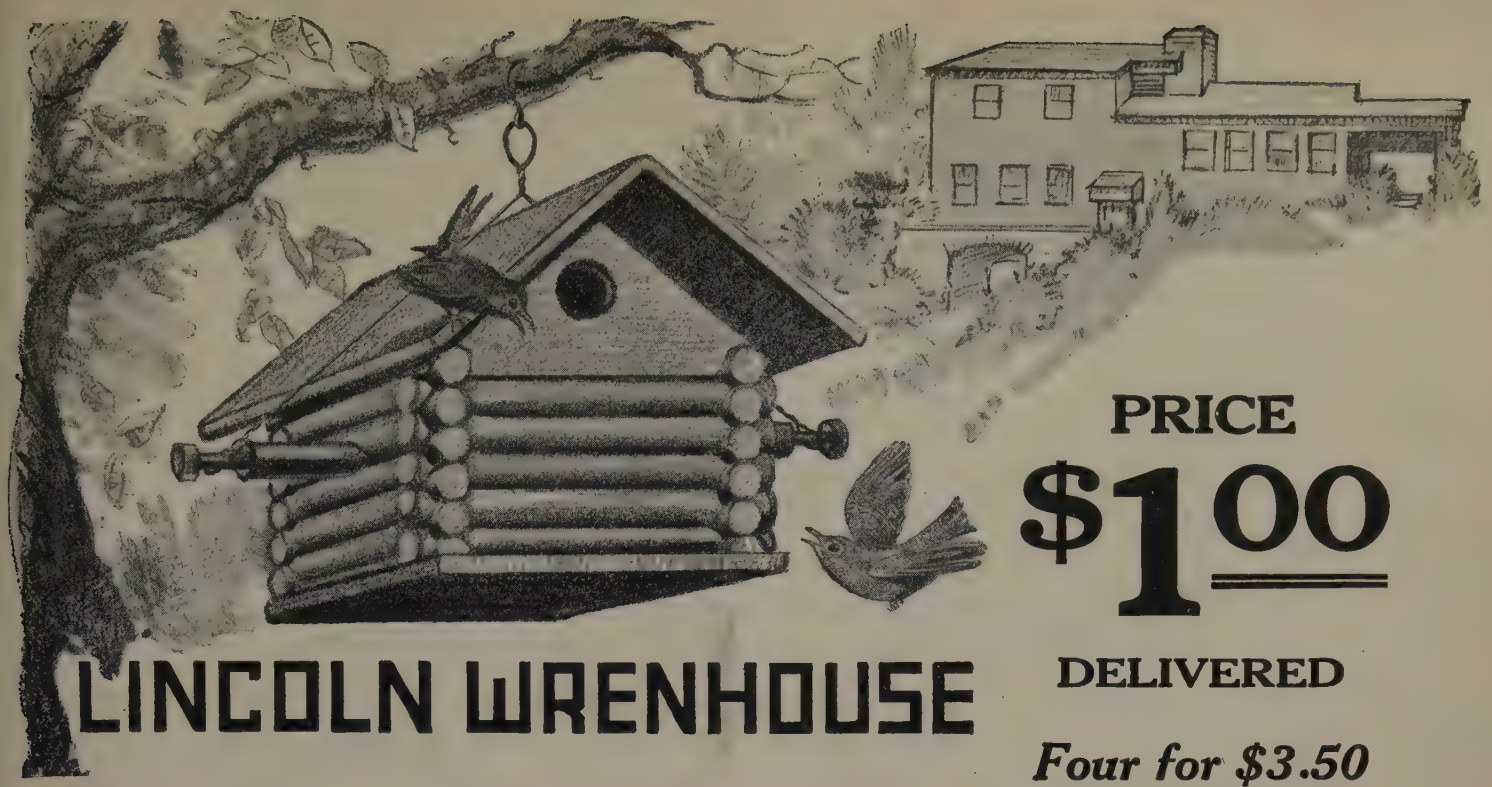

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PRICE

$1.00

DELIVERED

Four for $3.50

Invite a family of these little feathered friends to be your guests for the summer. Enjoy their songs—watch the little ones venture out into the world on their tiny wings.

This bird house is artistic and built on scientific principles — it looks like a miniature log cabin. Made of wood, tinted a soft brown that attracts the birds and has a strong, weather-proof roof. It comes *knocked down* and is easily put together. The price is only $1.00 delivered. (Canada $1.50 including duty and postage.) See your dealer or mail coupon today.

Be ready for the birds when they arrive

Join the nation-wide movement for the preservation of our birds.

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216 East Erie Street, Chicago

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1 Lincoln Wren House for **$1.00**
4 Lincoln Wren Houses for **$3.50**

With the understanding that you will refund my money if for any reason I wish to return the bird houses after five days, I enclose herewith $

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SCIENTIFIC WREN HOUSE

It brings the wrens! 4-compartment house for succeeding broods. Beautiful to hang. Green. Oak with cypress shingles. 28" high, 18" dia. $7.00

SHELTERED FEEDING STATION

Attracts early birds. Operates like a weather vane. Always dry. Green, of pine. With 8-foot pole, shelter 24x22x12 inches. $8.50

FORTY YEARS LOVING STUDY OF THE BIRDS

Dodson Bird Houses

ENJOY THEM, ON A SQUARE FOOT OR ON AN ACRE!

Folks get an idea the song birds must have a park or vast estate . . . Oh, no! There's a little pair of wrens, bluebirds, fly-catchers, just waiting for a home on the eaves of your house. Or on the tree just outside. And they'll WORK merrily all summer to rid you of mosquitoes, gnats, cut worms and insect pests! . . . These scientific houses pay in lastingness. They are the best a famous student of bird life can offer . . . Crated, ready to put up. Order by mail. Or write to Mr. Dodson

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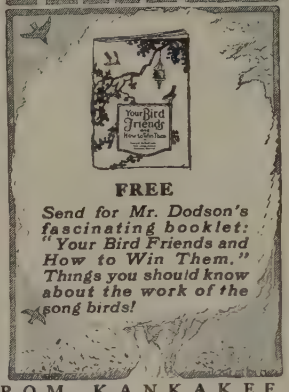
QUEEN ANNE MARTIN HOUSE

48 rooms for the beautiful martins who colonize. Scientific porch. White, green trims Of pine, copper roof 22-foot pole, 36x26x37 inches. $60.00



FREE

Send for Mr. Dodson's fascinating booklet: "Your Bird Friends and How to Win Them." Things you should know about the work of the song birds!

Ask about Dodson's Famous Sparrow Trap, $8.00

REAL DODSON BIRD HOUSES SOLD ONLY FROM KANKAKEE

The Nursery: Forestry's Show Window

(Continued from page 232)

could have been planted if the supply had been available. Forest and shade trees were sold from the nursery at the cost of production. Although Kentucky's Legislature has done away with the forest commission, the two state nurseries have been kept up, selling trees at cost. The state forest nursery of Maine at Orono has growing pains and has been chronically behind the demand for several years. Indiana's nursery at Henryville has been trying to make its resources of nearly 350,000 seedlings and transplants go around among the whole Hoosier family.

At the school of forestry at Moscow, Idaho, a small nursery is maintained, distributing about 100,000 trees to meet the present demand. Iowa has an experimental nursery at its state college at Ames. New Jersey grows only species it cannot obtain from the commercial nurseries. Vermont has two nurseries, one at Sharon growing about 50,000 trees a year and another at Essex, a somewhat new venture.

Growing young trees that will one day be tall, valuable citizens, these nurseries are performing a great economic task. They serve a still further purpose as the "show windows of forestry." Rows upon rows of baby maples, oaks, firs and pines—for all the world like a three-year-old youngster dressed up in a diminutive suit of evening clothes—growing in a nursery are fascinating. Then, too, the state nursery able to supply its citizens with comparatively small quantities of trees, spreads the habit of tree planting. Neighbors vie in growing their personal forests. They spread a greater appreciation of fire protection for having grown trees themselves. People find it a sport to master the art of making trees prosper. And the nurseries are doing this with ever-increasing success.

On the Trail

"Generally speaking, both sexes are at their best or their worst on the trail," says Mary Roberts Rinehart in "The Out Trail," published by Doran. "The wilderness is no half-way ground. Either one belongs or one does not, and one person of either sex who does not can ruin a trip, spread dissension in camp, lose the cook, and fill otherwise peaceful individuals with murderous thoughts.

"For those who are in doubt as to their fitness for the open, a small catechism should be prepared and frankly answered. Thus: Can I sleep, eat, and partially dress on the ground? Can I digest fried foods and hot breads for an indefinite period? Can I ride (or hike afoot) long distances without complaint?

"Am I unhappy without: (*a*) telephones; (*b*) bed sheets; (*c*) manicures; (*d*) beefsteaks; (*e*) mail; (*f*) table napkins; (*g*) fresh cream; and (*h*) a bathroom?

"Do I dislike: (*a*) sunburn; (*b*) rain; (*c*) fish; (*d*) things that crawl; (*e*) horses; (*f*) mosquitoes; (*g*) muscular effort; and (*h*) nature unadorned by buildings, railroad tracks, and motor cars?

"Only after such heart-searching inquisition should the novice venture into the open."

A Gift for a Friend!

"*The Lark*" Bird Bath

Size: Height, 29"; Saucer, 23½" Diameter; 1¾" deep.

Price, $14.00 F.O.B. your town.

Illustrating but one of many sizes and designs of our Bird Baths, made of crushed Marble or Granite and fully warranted.

Height, 29"; Saucer, 23½" wide; 1¾" deep

Our catalog of Garden Ware—Pots, Urns, Window Boxes, Fountains, Seats, etc.—free upon request.

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Why You Can Buy This $2500 Lamp for Only $5.90

The Decorative Arts League actually spent that amount for the model of a lamp which would be the last word in beauty of design and execution—that they might offer reproductions of it at a price within reach of all who appreciate artistic creations for every-day use.

JUST as the craftsmen of olden times contrived to make their creations as lovely as they were useful, so artists today have been won over by the Decorative Arts League to the fashioning of beautifully wrought articles for every-day use. Naturally, one of the first things to engage their attention has been the designing of a medium-sized table lamp to replace the usual inharmonious commercial product.

Under the auspices of the Art Alliance of America and the Decorative Arts League, a national exhibition was held, in which artists from all over the country entered their designs. Large enough cash prizes were offered to attract the finest talent, and a jury of eminent artists and critics selected the lamp that in their judgment was the acme of beauty and utility.

Brings Beauty and Good Taste to any Home

This delightful lamp is 16½ inches high and the shade is 13 inches in diameter. The graceful base is cast in medallium of rich, statuary bronze finish. The parchment shade, so much in vogue just now, is designed as a unit with the lamp. It is in tones of gray-gold-brown graded into ivory brown, with dark band around the flare and edges bound with strips of dull brass that make it as durable as it is charming. Being of neutral tone, it will harmonize with any decorative scheme. *For oil, gas or electricity.*

$2,500 for One Lamp

The result was the now famous and altogether charming lamp submitted by Miss Mary Bishop, which the Decorative Arts League secured at a cost of over $2,500, as the one design unmistakably supreme for its purpose.

The League has always held that artistic lamps need cost no more than drab, commonplace ones, so they were willing to spend so much money on one lamp that they might sell duplicates of it for as low a price as $5.90.

The sole reason the League is able to sell it so reasonably is because it has a "corresponding membership" of people who are interested in learning about artistic new things for the home that they might never hear of otherwise, and in buying them at such remarkable prices they could not possibly equal them elsewhere. Such a membership costs nothing and involves no obligations of any kind. Few of the League's offerings are ever advertised to the public, and it is only occasionally that some special achievement like the Bishop Lamp is announced, in order to increase the membership among discriminating people.

Sent Without Money in Advance

All you need do to get this delightful lamp, however, is sign and mail the coupon. When the postman delivers the lamp, simply give him a $1 deposit (plus postage) just as an evidence of good faith. Keep the lamp for five days, see it in use, study its effect. At the end of that time, either send $4.90 to complete the full payment, or return the lamp and get your deposit refunded. Examine it thoroughly, compare it with the lamps you could get at the same or even higher prices in the shops. Then decide whether you can afford to let slip by the opportunity of getting such an exquisite lamp so inexpensively.

Send the coupon today. Become a member of the League and get this beautiful lamp while you can. NOW—before you forget it. Decorative Arts League, Dept. 94, 505 Fifth Avenue, New York City.

Decorative Arts League, Dept. 94,
505 Fifth Avenue, New York City

You may send me the Mary Bishop Lamp. When it comes I will pay the postman $1 deposit (plus postage). If I am not delighted with it, I will return it at the end of 5 days and you agree to refund my deposit.

If I do not return it then I agree to send you the $4.90 still due on the purchase price.

Please enter my name as a corresponding member of the League with the understanding that it entails no cost or obligation.

Name.....

Address.....

City.....State.....

Gas.....Oil.....Electricity.....

Orders for shipment outside the U. S. must be prepaid and cannot be sent on approval.

CANADA ~
Where fish are hungry for the fly
IN a thousand crystal lakes and streams of Canada, speckled trout and salmon are close to the shore snapping at unwary insects spring has brought. They are hungry for flies. In June the season for black bass opens.
In this primeval wilderness where the black bear still robs the honey bee—the cool "Highlands of Ontario" and Quebec and the wooded Maritime Provinces—things are to the liking of Izaak Walton's disciples.
So forget carking care. Get out your rod, reel and fly book. Come and enjoy life. Such districts as Georgian Bay—Muskoka—Lake of Bays—Algonquin Park call you.
Write nearest office for full particulars and information as to where you should go. They can also furnish you with names of guides, etc. You can arrange all details before you start.
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Offices
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New York—1270 B'way, Cor. 33d St.
Philadelphia—401 Franklin Trust Bldg.
Pittsburgh—505 Park Bldg.
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The Largest Railway System in the World

DON'T USE THE WRONG NAME

Have you been embarrassed because you did not use the proper common or scientific name when buying or selling plants? It will never happen again if everybody owns and uses

STANDARDIZED PLANT NAMES (The New Plant Check-List)

Standard Edition, bound in cloth, for library and general use, **at $5.**

Pocket Edition, flexibly bound in Fabrikoid, printed on India or "Bible" paper (weighs but 11 ounces, barely a half-inch thick, fits coat pocket easily), **at $6.50 each.**

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Send your order to

NATURE MAGAZINE
1214 SIXTEENTH STREET, WASHINGTON, D. C.

Arbutus

(Continued from page 229)

flowers to expose themselves in order to advertise their nectar that pollinating insects (usually bees) may be attracted and assist in scattering the pollen from flower to flower.

In spite of the offering of nectar in payment for pollination, most of the blossoms do not set seed. I have heard it said that arbutus seeds do not ordinarily form, but this is hardly true, since a diligent search during late summer will frequently be rewarded by the discovery of seeds. I have found arbutus seeds in Pennsylvania and again on the picturesque sand dunes along the Lake Michigan shore of northwestern Indiana. It is possible, however, that arbutus fails to mature visible seeds in some sections.

Not only is arbutus one of our most attractive spring wild flowers, but the plant is closely related to the very finest of our native plants. Among its first cousins may be mentioned the gorgeous mountain laurel, the shy little wintergreen, the beautiful and stately rhododendron, the strikingly handsome mountain azalea or pinxter flower, and the charming rhodora of New England. No member of our native flora can boast of handsomer or more attractive family connections than this. When specimens of these wonderful plants were first exhibited in Europe by pioneer botanical explorers of the New World, they excited boundless admiration and tempted many fruitless efforts at cultivation. For many years, however, these wild American species resisted all attempts to tame them, and they shrivelled and died in gardens and greenhouses under the blighting touch of civilization.

Arbutus is the state flower of Massachusetts, where its very existence is threatened by the depredations of street venders and other promiscuous pickers of plants. So serious is the situation in Massachusetts that the state legislature found it necessary to pass a law to protect arbutus against the ravages of flower vandals. Not only in Massachusetts but throughout its range the lovely plant is in danger of extinction; in fact, arbutus has already been exterminated over wide areas. In the region of Cornell University, for instance, arbutus was formerly plentiful, but, due to the efforts of "Mayflower parties" and other thoughtless pickers, the plant is now practically extinct within a large radius of Ithaca. I personally witnessed the total extinction of arbutus within the short space of four years in Shingletown Gap, a picturesque cleft in the mountains near State College, Pennsylvania.

The gradual disappearance of this attractive native wild flower is not only very regrettable but is absolutely unnecessary, since it can be avoided by the exercise of a little thought and care. As ordinarily picked, the creeping stems of arbutus are

(Concluded on page 256)

Have You Heard of the Secret That Lives in a Rose?

It is a beautiful secret, buried deep in the heart of the fragrant flower. But Nature wants to have no secrets from you who are her lover. She wants to tell you of the bird that walks on water, of the land where oysters grow on trees. She wants to tell you wondrous tales of a moth that lives in the lily, and of the bird that pays with its life for its laziness. She wants to tell you of wicked night-moths, of the oriole, of the flowers that build cunning death-traps.

Let Nature Tell You of Her Mysteries

COME through the magic portals, into the great wonderlands of nature! Meet the bird that wears a moustache. Watch the great feast of the humming-birds, and see how they thank the flowers. Visit the sinners in vegetable land, and stay to see the plant that makes soup of its guests.

Nature's daily miracles! They are going on everywhere around you—birds that whistle when they are glad, trees that walk to be nearer the stream, flowers that are branded like criminals, moths and butterflies that live like human beings. Are all these miracles hidden from *you*? Or can you recognize the love-call of the nightingale; do you know the maple tree from the birch; can you tell a toadstool from a mushroom?

The whole of nature stretches out its arms to you. Welcome, nature-lover!

Daily Miracles Revealed In Print and Picture

The famous Little Nature Library reveals, in delightful print and picture method, all the mysteries and miracles of nature. At your own fireside you can meet all the remarkable birds and trees and flowers of the nature kingdom. Here is one of the finest nature studies ever published.

The Little Nature Library is not technical. It is simply but beautifully written, exquisitely illustrated, and rare bits of human interest thread the pages. Here is useful, interesting and highly elevating reading for the person who loves nature and wishes to be well-informed.

Send No Money

May we send you, on our special approval plan, the Little Nature Library? We know that you will be fascinated the moment you see these books, and we are eager to give you the opportunity to examine them.

No money is necessary. Just clip and mail the coupon and the Little Nature Library will be sent to you at once for 5 *days' free examination.* You will be the judge. If you are not carried away by the very beauty of these books, by the sheer pleasure of possessing them—simply return them and the examination will have cost you nothing whatever.

You owe yourself the free examination. Send off the coupon today.

Nelson Doubleday, Inc.
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Garden City, New York

Nelson Doubleday, Inc., Dept. L-1484
Garden City, New York

I want to know more about nature's daily miracles. You may send me the complete Little Nature Library, in four volumes, for 5 days' free examination. Within the 5-day free period I will either send you $1.50 as first payment, and then only $2 a month for 3 months, or I will return the books without any further obligation. It is understood that I need not keep the Little Nature Library unless I am delighted with it.

Name .....
Address.....
City .....State.....

(If you prefer to send cash with order, you need send only $7 in full payment.)

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A Choice Summer Camp for Boys on a Lake in the Maine Woods near Searsmont, Maine

Exceptional Care and Personal Supervision Given Every Boy

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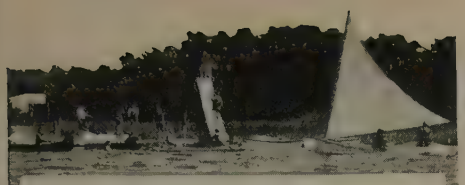

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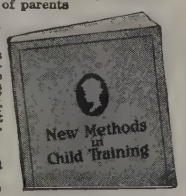

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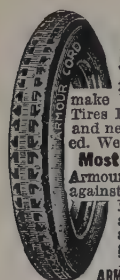

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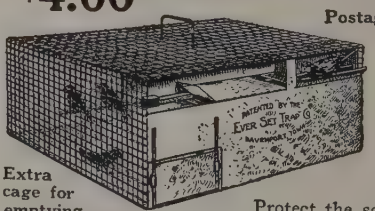

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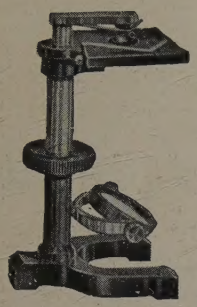

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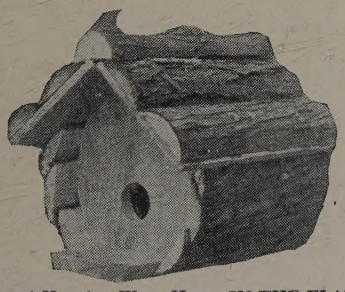

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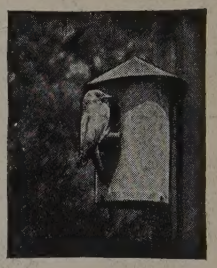

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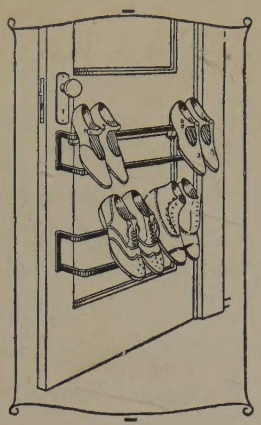

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Arbutus

(Continued from page 250)

literally pulled out by the yard in an effort to secure long-stemmed bunches. When the stems are removed the plant is exterminated. On the other hand, if the flowers are gathered in such a manner that the creeping stems are left undisturbed, little harm will result and the stems will continue to send up new bunches of sweet-scented flowers year after year. The best way to gather arbutus is to use a small pair of scissors or a sharp knife and sever the flowering stems close to the creeping stem. By so doing the leaves will be allowed to remain and manufacture food for the production of many future crops of shy blossoms. One way in which we can all help to protect arbutus is by refusing to purchase the little bunches offered for sale every spring by street venders, since street flower merchants usually gather their wares with little regard for the future.

Arbutus has frequently been suggested for honors as a national floral emblem on account of its dainty blossoms and rare fragrance. No flower is more intimately connected with the early history of America. Its limited range and difficulty of cultivation are the arguments most frequently heard against arbutus. Until recently it has been considered practically impossible to successfully transplant arbutus, but under the tender guidance of the government botanist a method has lately been discovered by which it can be successfully transplanted. It is sincerely hoped that this method will preserve these "sacred flowers of faith and hope" for countless oncoming generations.

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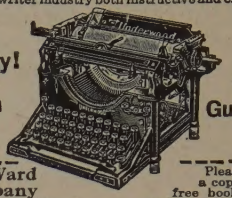

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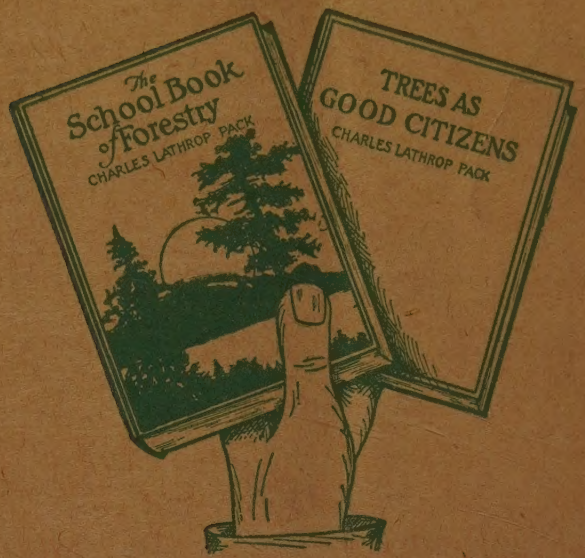

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